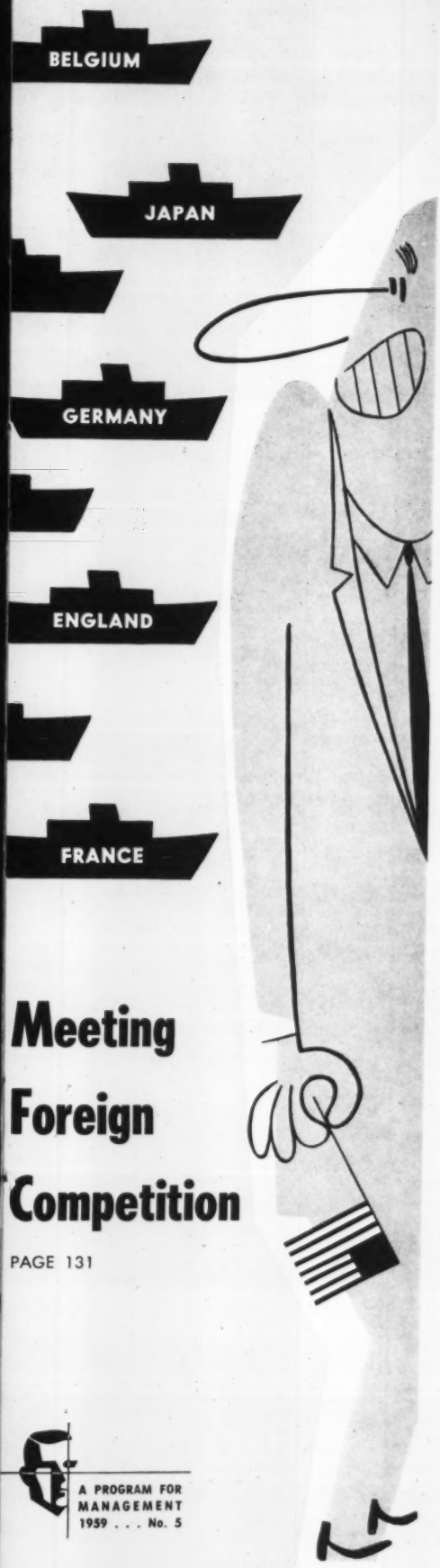
JUNE 15, 1959

STEEL
The Metalworking Weekly

A PENTON PUBLICATION




# Meeting Foreign Competition

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## Metalworking Capacity to Go Up 2.7% in Second Half of 1959

## Steel Boom in China Ominous

## Shaped Raw Material Cuts Cost

## Ford System Revitalizes Quality

## Scrap Shear Uses Rotary Blade

## Foreign Steel Trickles, May Flood Into Great Lakes Ports via Seaway

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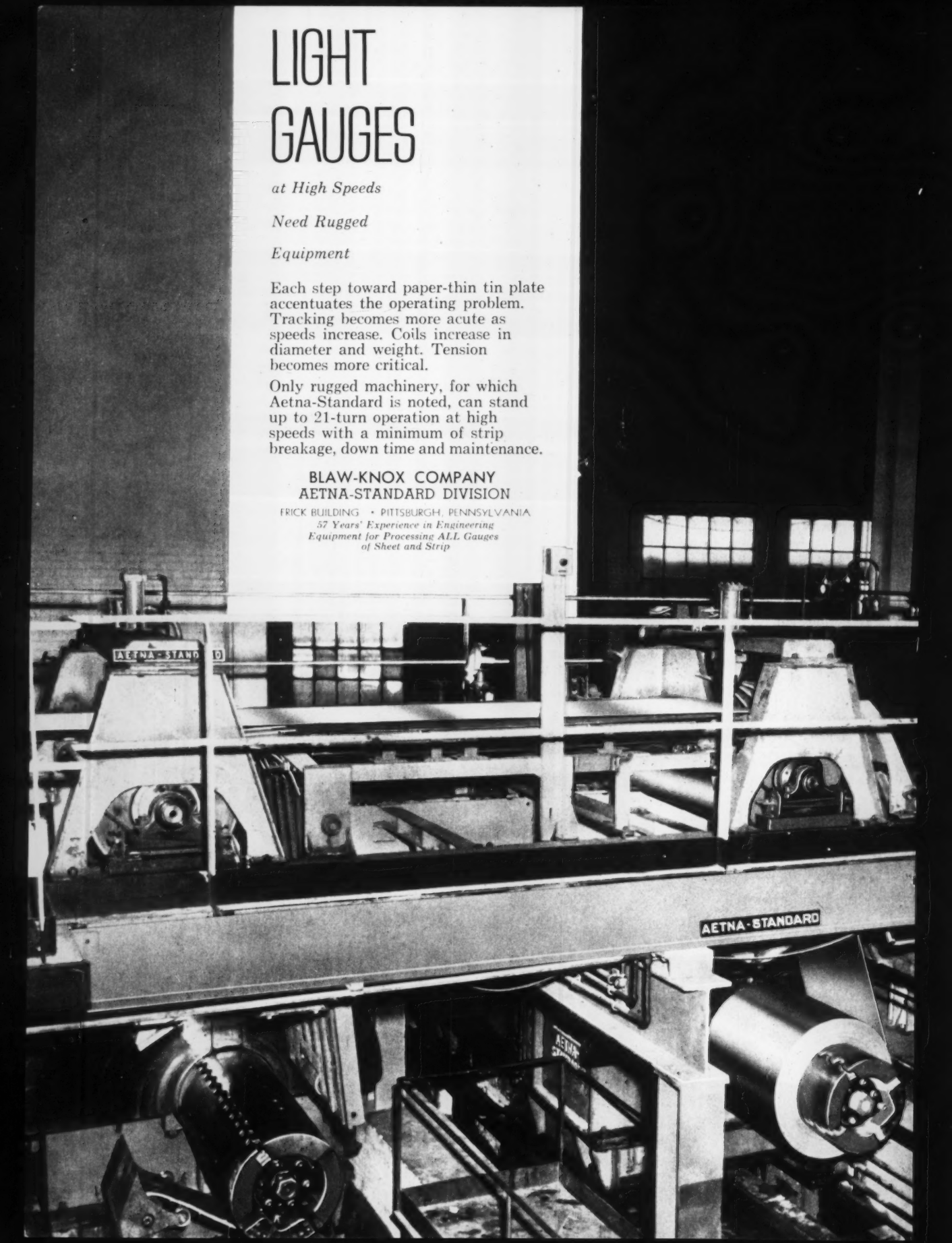
1959 . . . No. 5




# LIGHT GAUGES

*at High Speeds*

*Need Rugged*

*Equipment*

Each step toward paper-thin tin plate accentuates the operating problem. Tracking becomes more acute as speeds increase. Coils increase in diameter and weight. Tension becomes more critical.

Only rugged machinery, for which Aetna-Standard is noted, can stand up to 21-turn operation at high speeds with a minimum of strip breakage, down time and maintenance.

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**AETNA-STANDARD DIVISION**

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*57 Years' Experience in Engineering Equipment for Processing ALL Gauges of Sheet and Strip*

# This Week in STEEL

The Metalworking Weekly

June 15, 1959 Vol. 144—No. 24

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**Index available semiannually.**

**STEEL is also indexed by Engineering Index, 29 W. 39th St., New York 18, N. Y.**

STEEL, the metalworking weekly, is selectively distributed without charge to qualified management personnel with administrative, production, engineering, or purchasing functions in U. S. metalworking plants employing 20 or more. Those unable to qualify, or those wishing home delivered copies, may purchase copies at these rates: U. S. and possessions and Canada, $10 a year; all other countries, $20 a year; single copies, 50 cents. Metalworking Yearbook issue, $2. Published every Monday and copyright 1959 by The Penton Publishing Co., Penton Bldg., Cleveland 13, Ohio. Accepted as controlled circulation publication at Cleveland, Ohio.



**Metalworking Pulse ▶**

TURN

# Metalworking Pulse

## INDUSTRIAL PRODUCTION INDEX

| | WEEK ENDED JUNE 6 | PREVIOUS WEEK | MONTH AGO | YEAR AGO |
|---|---|---|---|---|
| (1947-49=100) Based on steel output, electric power output, freight carloadings, auto assemblies | 173* | 169 | 169 | 134 |

*Preliminary.

For the fourth time within a month, STEEL's index has climbed to a record. It exceeds the prerecession peak by 5 points. But with the steel contract deadline approaching, there aren't many more records in sight.

*Details on Page* 109

## U. S. PASSENGER CAR PRODUCTION

| | WEEK ENDED JUNE 13 | PREVIOUS WEEK | MONTH AGO | YEAR AGO |
|---|---|---|---|---|
| Number of units assembled ..... (Source: Ward's Automotive Reports.) | 132,000* *Estimated. | 126,298† †Preliminary. | 135,856 | 78,163 |

With the holiday effects out of the road, auto and truck output should return to pre-Memorial Day levels. May sales in excess of 500,000 cars guarantee another half million unit production month in June.

*Details on Page* 106

## NATIONAL STEEL INGOT PRODUCTION

| | WEEK ENDED JUNE 14 | PREVIOUS WEEK | MONTH AGO | YEAR AGO |
|---|---|---|---|---|
| Net tons (thousands) ..... | 2,681* | 2,653 | 2,631 | 1,728 |
| Index (1947-49=100) ..... | 166.9* | 165.2 | 163.8 | 107.6 |
| Percentage of capacity ..... | 94 | 94 | 95 | 64 |

*Estimated.

Steelmakers still encounter difficulties in lifting operations to desired levels. Output has fallen an average of 36,000 tons a week below scheduled rates for the last two months. The total, though, has set a record.

*Details on Page* 190

## STEEL SCRAP PRICE COMPOSITE

| | JUNE 10 | WEEK AGO | MONTH AGO | YEAR AGO |
|---|---|---|---|---|
| Based on No. 1 heavy melting grade at Pittsburgh | $35.50 | $35.00 | $33.33 | $35.67 |

A $1 advance in the price of No. 1 heavy melting steel scrap at Pittsburgh and a 50 cent increase at Chicago lifted STEEL's composite 50 cents a ton to $35.50. This is a new high since the first week in April.

*Details on Page* 202

## FINISHED STEEL PRICE INDEX

| | JUNE 9 | WEEK AGO | MONTH AGO | YEAR AGO |
|---|---|---|---|---|
| Based on Bureau of Labor Statistics data (1947-49=100) | 186.7 | 186.7 | 186.7 | 181.5 |

In view of the possibility of higher steel prices this summer, users are pressing for deliveries of June tonnages. Orders usually specify "price at time of shipment." Some deliveries are three weeks behind schedule.

*Details on Page* 191

# Tool Steel Topics

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

Export Distributor: Bethlehem Steel Export Corporation

## Lehigh H makes deep draw... passes test with flying colors

It takes a deep draw to form these cone-shaped lamp shades from .025 in. steel sheet at Keystone Lamp Manufacturing Co., Slatington, Pa. The forming die frequently gave trouble, causing production to bog down.

The lamp maker contacted Luria Steel Supply Co., a distributor of Bethlehem tool steel. "We know the job is difficult," they said, "but perhaps you can tell us about a tool steel that will withstand such a deep draw."

The Luria representative had seen such problems before. "I'd recommend Lehigh H," he told them. "I've seen it handle plenty of tough applications. It has all the stamina you need for this job, and then some."

The Lehigh H die, hardened to Rockwell C60, performed just as he said it would. It had high surface hardness to prevent pickup and galling. Because of its high wear-resistance, it averaged 200,000 shades, a substantial increase. Only .010 in. had to be removed when redressing was necessary.

Lehigh H (AISI D-2) is our standard high-carbon, high-chromium grade of air-hardening tool steel. It is a deep-hardening grade with high compressive strength. It has high wear-resistance, plenty of toughness, and minimum size change during heat-treatment — the characteristics you need most for maximum production.

TYPICAL ANALYSIS

Carbon 1.55 Chromium 11.50 Molybdenum 0.80
Manganese 0.40 Vanadium 0.90

The best way to appreciate the advantages of Lehigh H is to put it to work. A trial run in your shop can be arranged by your local Bethlehem tool steel distributor.

## BETHLEHEM TOOL STEEL ENGINEER SAYS:

### *You Can Remedy Fatigue-Failures*

Chisels and other tools which are subjected to repeated stresses often fail suddenly. Because these tools are made from shock-resisting steel, the sudden failures can appear mysterious. However, close inspection of the failed parts often reveals that the failures were not sudden at all. They occurred because a crack progressed part way through the section, followed by sudden fracture of the remaining section.

Fatigue-fractures have a characteristic, smooth-rubbed surface where the initial crack opened up, plus an inner crystalline zone revealed by the final sudden break. Often the smooth-rubbed surface shows parallel "oyster-shell" markings, and sometimes, evidence of rusting.

As a rule, fatigue-failures begin at a stress-concentration point, such as a notch, a poor fillet, tool mark, accidental nick, or deep stamping. The proper cure is to correct such design or mechanical faults promptly.

### *USE UPSET-FORGED DISCS FOR ALUMINUM EXTRUSIONS TOOLING*

Bethlehem produces a full line of upset-forged discs for the manufacture of dies for aluminum extrusions. The discs are forged by expert hammer crews. They are finished in ring dies to insure good section. You can choose from two grades of tool steel—Cromo-WV, chrome-moly-tungsten-vanadium (H-12), and Cromo-High V, chrome-moly-high vanadium (H-13). Each grade has good resistance to erosion and heat-checking.

# ZIRCONIUM

## *costs less today than you may think!*

A recently-published article in Metal Progress* provided an interesting economic appraisal of zirconium and stainless steel in nuclear power reactors. The article covered five power-producing thermal reactors spanning the entire range of fuel enrichment. To supplement these facts, we would like to add these key points about zirconium.

**Check TODAY'S Zirconium prices**

In our discussions with designers and builders of nuclear reactors, we still find some who think of zirconium prices in terms of $100 per pound. Actually, high quality zirconium strip and rod are available through Mallory-Sharon at *$11 to $14 per pound*. Even tubing—always more expensive in any metal—is frequently priced at under $30 per pound.

**What is the break-even point?**

In four of the reactors discussed in the article, the break-even price for fuel cladding material ranged from $44 to $104 per pound. On permanent parts, the range was from $109 to $842 per pound. Thus zirconium, at present prices, offers important economic advantages over stainless steel.

**Future price trend important**

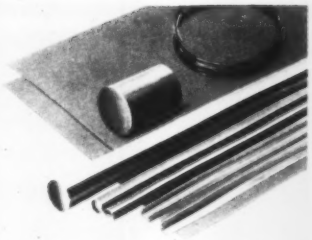
The break-even point is not necessarily a static one. Future trends in prices of both zirconium and stainless steel must be taken into account.

For example:

1. As zirconium production and use increases, price of mill products will be reduced still further.
2. Increases in stainless steel prices will raise the break-even point.

Thus, for the future, certain applications which may be borderline cases at present, will most surely show definite economic advantages for zirconium.

*Careful quality control of zirconium tubing and other mill shapes is a continuous top-priority assignment at Mallory-Sharon.*



*Typical mill shapes produced in zirconium by Mallory-Sharon include rounds, bars, billets, wire, sheet, strip, plate, tubing.*

**Advantages of Zr for refueling**

The declining price trend of zirconium has a vital bearing on cost of future refueling operations. Even where zirconium's present economic advantage may be close to the borderline, future price reductions will substantially increase this advantage 1½ to 2 years from now.

**Use of natural uranium a key factor**

Because of zirconium's low neutron-absorbing cross-section, uranium of lower enrichment may be employed. This further adds to zirconium's economic advantages through resulting savings in fuel costs.

**For pricing assistance . . .**

on zirconium for either fuel cladding or permanent parts, call on Mallory-Sharon. As the only integrated producer of zirconium, we are in a position to render valuable help on pricing your designs or bill of materials—as well as providing lowest prices and highest quality for all types of zirconium mill shapes.

*"An Economic Appraisal of Stainless Steel and Zirconium in Nuclear Power Reactors," appearing in Metal Progress, February, 1959. WRITE MALLORY-SHARON for free reprint!

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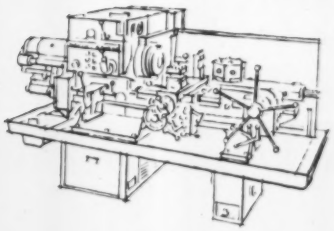
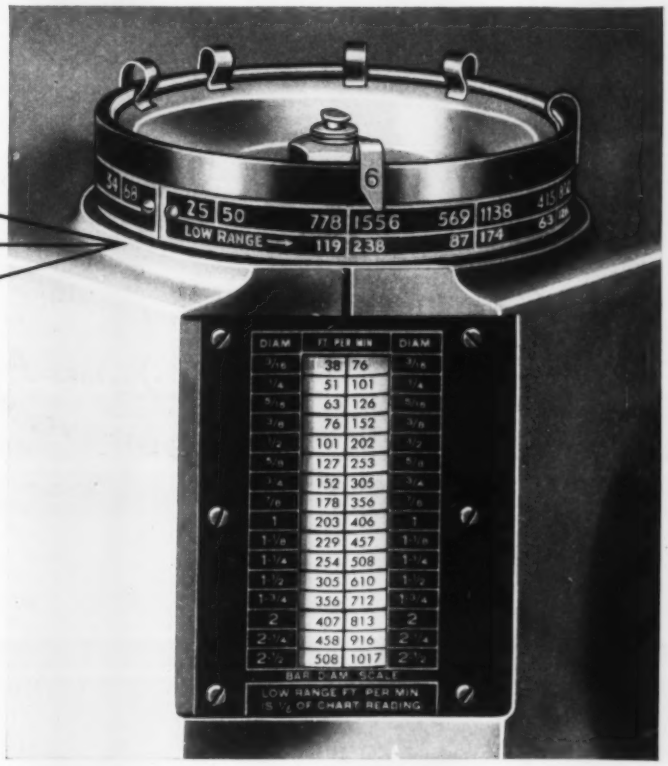


# If you

were a turret lathe operator today, wouldn't **you** want to work at a machine with this easy method of preselection?




Only Warner & Swasey offers this direct-reading speed selector calibrated in work diameter, surface feet, and spindle rpm's—thus, no slide rules or conversion charts are required to determine proper spindle speeds. Movable number clips indicate at a glance your job's sequence of speed changes.

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# 32 Clevelands keep 450-ton ladle cranes on the job at Geneva Works

Moving big tonnage up and down, forward, backward and sideways is all in a day's work for 32 Cleveland built-in drives installed on the bridge and hoist of these 450-ton ladle cranes. These and many other Cleveland Worm Gear Drives and Speed Reducers can be found throughout the mill driving pushers, levelers, edgers, conveyors and other cranes.

Because of their established "long-life" service records, Cleveland drives are recognized leaders for keeping maintenance and replacement costs to the absolute minimum. Contact a Cleveland Field Engineer, or write for Bulletin 145 describing how Cleveland Worm Gear Drives solve tough production problems and reduce maintenance costs.

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**3270 East 80th St., Cleveland 4, Ohio**

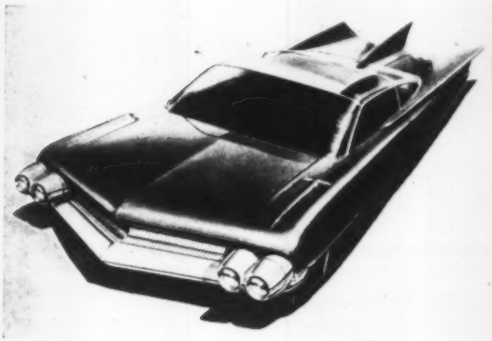
Subsidiary of
Eaton Manufacturing Company

*Affiliate: The Farval Corporation*

**CLEVELAND**
**Worm Gear**
***Drives***

## Clip a Coupon to Win

In one of our original stories on the "Beat - the - Experts" contest, Detroit Editor Don Postma asked George W. Walker, Ford vice president and director of styling, what he would call his dream car rendering. Affable Mr. Walker (right) replied: "I suppose Canaveral, but let your readers name it." Among the names submitted: The Jasper, from Milton Hackett, Longview, Tex., ". . . something compact yet pleasing to the eye"; J. H. Quatmann, Cape Girardeau, Mo., likes Star Lestial; Visadream is from Edward H. Wheeler, Ambler, Pa.; and Triumph Americana is sent by Ralph S. Kinker, Machias, Maine. Full color prints of the car (below) will go to ten runners-up who "Beat-the-Experts" at estimating auto production in the U. S. from Jan. 1 through Dec. 31, 1959. The winner will receive a 1/10 scale model of General Motors' Firebird III. The contest closes at midnight, June 30.



## Not with a Whimper . . .

In our May 4th issue, we told the world that austenitic manganese (Hadfield) steel, after shot peening, could spall under severe continuous loading.

"Not so!" says Norman A. MacLeod of La Habra, Calif., the inventor of explosive hardening. We quote: "I am interested in the article: 'This Part Is Hardened with Explosives,' pp. 84-85 of STEEL, May 4. May I point out that shot peening will never cause spalling as practiced commercially, even in ordinary steel . . . I did say that a heavy load could produce flow since the subsurface is still soft and unaffected by shot peening."

Thank you, Inventor MacLeod, for clearing up this point. We're thankful that a man with so much experience in handling explosives sent us an informative note instead of a package merrily ticking away in a plain brown wrapper . . .

## How Judges Keep Impartial

Though it's not in the rules (because there aren't any), lots of readers have been sending along substantiation for names they submit in this department's "You Name It" contest. We don't allow as how we could be prejudiced by a few words, but here are some phrases from a New England reader that sound like they were recorded in one of the planning sessions which preceded the department's launching. We've edited the letter so his suggestion is deleted.

"Most of us read these pages in technical journals . . . to provide ourselves with a lift from the more serious, heavily concentrated reading of technical articles; we are looking for refreshment, and the informality and the conversational tone of the page provides it. At the same time, the editor is stepping down from his high plane of 'we' to the more informal 'Ed.' It reflects the approach of your publication to its readers. Your articles, artwork, and advertisements are your journal's character; your reader's page is your journal's personality."

## Name It Soon

That's a fine slant on our thinking. Thanks for including it. The contest will run until midnight, June 23, so you still have time to send in a name. Remember, the winner will sport Honorary Editor card No. 1. After a brief spell of soul searching, we decided that the New England entrant would remain in anonymity, and his entry will stand on its merit without the letter to speak for it.

## Who Said That?

The subject of anonymous letters has been cussed and discussed by editors for years. Here

**I believe _____ automobiles will be produced in the U. S. from Jan. 1 through Dec. 31, 1959.**

**Mail this to:**
**Beat-the-Experts**
**STEEL**
**Penton Bldg.**
**Cleveland 13,**
**Ohio**

PRINT NAME _____
POSITION _____
COMPANY _____
ADDRESS _____
CITY _____
STATE _____

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All easy to produce, consistent to control, giving long corrosion protection.

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are a couple of cases in point.

We have a letter from a reader, who shall be nameless (because he initialed his letter TBF, for Truly B. Fuddled) asking Acton Chance:

"Who was going to pay the $67,000 taxes? Russians? (in 'The Case of the Vanishing Taxes,' STEEL, May 11, pp. 100-101). Why not award all domestic contracts at double the bid price and rake in the taxes? If the Navy will save $37,000 on every contract it places, our tax bill should drop a zillion bux. Yours, TBF."

We'd like to answer dear TBF thusly: "Ever hear of 'paper' savings? It's like 'paper' profits, only worse." Here's another example of the anonymous writer who deserves an answer, but we can't give one:

"Referring to STEEL for May 18th, first paragraph, p. 47, where David McDonald demands a four day, 32 hour week every four weeks. Why doesn't the press emphasize that this is another form of featherbedding? Sincerely, A. Reader."

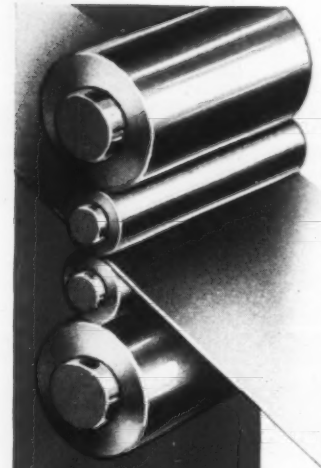
## And We Reply . . .

It's a matter of policy to refrain from publishing anonymous letters in STEEL. If you believe that your views will jeopardize your job, or some such, we suggest you send letters to us on your company's letterhead and include your name and title. We have to validate inquiries. If your letter is sufficiently compelling, and if you specifically request that we don't divulge your name, the letter will be published in anonymity.

## Bluecollars Get Bleached

A few months ago, the U. S. Department of Labor disclosed that a decided shift had taken place in the American labor force. For the first time, the number of people in whitecollar jobs exceeded those in bluecollar jobs. While digging out material for next week's story, "Labor Recruits Whitecollar Members," Washington Editor Jack Botzum had this picture snapped in front of the AFL-CIO offices. Says Jack: "This serves to prove that not every editor gathers material by sitting in the National Press Club."

Jack also covered the offices of the USW, UAW, the Labor Department, and others, to round up a balanced story on these concerted drives.



## Here's where

# P/M PRODUCTIONEERED* EQUIPMENT

## UPS sheet & strip quality, squeezes costs, to offer a more satisfactory product

P/M PROCESSING EQUIPMENT INCLUDES:

CONTINUOUS PICKLING

VACUUM HANDLING

SLITTING

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Also:
Slit Coil Bending Equipment
Shearing & Cut-to-Length Lines
Coil Build-up and Inspection Lines
Leveling & Uncoiling — Recoiling
Continuous Lines for Annealing, Coating, Acid Blast Cleaning, & Miscellaneous Sheet & Strip Processing

*PRODUCTIONEERING is the P/M way of working so engineers who supervise equipment designing have first-hand knowledge of problems encountered by sheet and strip processing line users. In working with P/M you work with responsible engineers who apply their skill to solve your problems.

Mills using *PM Productioneered** lines are processing sheet and strip so it satisfies their customers better. In many cases this is done with simplified processing, and with actual cost saving.

There's no magic in this improvement. Good engineering geared exactly to the needs of the mill is the heart of *PM Productioneering. Example:* PM engineers suggested *minor modifications* in a line being planned, with the result that it was capable of handling a *much greater* variety of products; *example:* a line processing stainless was built to eliminate scratching previously considered unavoidable in the process; *example:* a slitting line with output doubled by improved coil handling and automatic handling . . . etc., etc.

*PM Productioneering* tailors processing lines to fit your needs because PM people study and understand your needs. Call in a PM man before you plan installation of any of the processing lines or equipment listed at left.

PM processing produces more satisfactory strip for this end product

**Production Machinery Corporation**
Mentor, Ohio

P/M®

# Republic High-Performance

**STAINLESS STEEL IS USED IN LEADING EDGES** of the 880's vertical fin and horizontal stabilizer where anti-icing is accomplished through electrical heating of the metal. Use of Republic ENDURO Stainless Steel increases strength and heat-resistance, permits thinner, lighter gages. Types 301 and 302 are readily formed into desired shapes by cold-forming, drawing, and bending operations. Mail coupon for complete details.

In the Convair 880—the world's fastest jet airliner—speed, economy, and medium-range operating requirements dictated the use of thousands of pounds of *high-performance* metals. Working closely with design engineers, Republic Steel supplied:

TITANIUM to increase strength-to-weight ratios . . . permit lighter weight with increased strength.

ENDURO® STAINLESS STEEL to increase heat and corrosion-resistance at elevated temperatures.

ALLOY STEEL to increase strength of major structural components . . . provide an extra margin of "beef."

Republic has pioneered in the development and production of new metals to increase strength, resist heat, reduce weight. With constantly expanding research as well as production facilities and capabilities, Republic is the nation's largest producer of *high-performance* metals —titanium, stainless, and alloy steels.

Let us help you find the most advantageous uses of these metals in *your* project. Return the coupon for complete information without obligation. Please indicate if you would like a Republic Metallurgical Specialist to call.

# REPUBLIC

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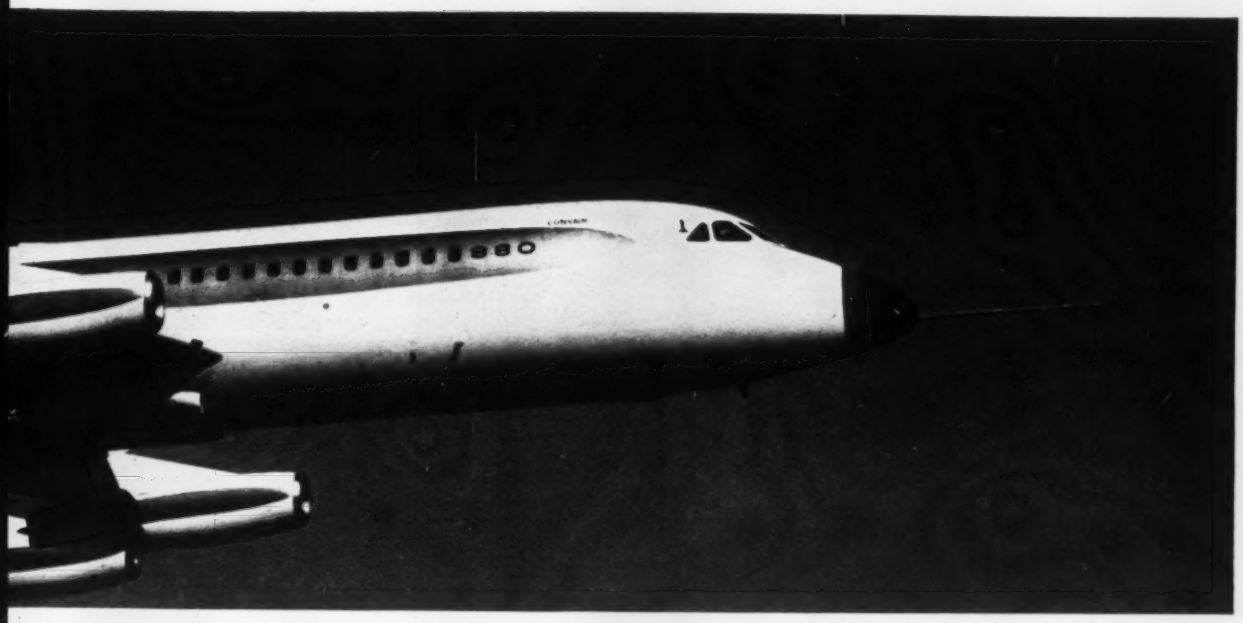
*World's Widest Range of Standard Steels*

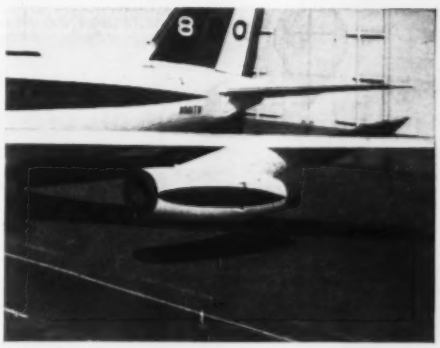


# Metals for the 880

**IN EACH 880 POD-PYLON,** rear engine mount "horseshoe" frame—of nickel-plated, chrome-alloy steel—grips the powerful General Electric CJ-805-3 engine. Republic Alloy Steels offer exceptionally high strength-to-weight ratios with the highest strength values. Uniform response to heat treatment assures complete deep hardening penetration, plus hard, wear-resistant surfaces. Send for additional information.

**REPUBLIC'S NEW HIGH-STRENGTH POWDER, TYPE HS6460,**

is ideal for sinterings of highly stressed components. Provides minimum tensile strength of 60,000 psi at 6.4 density as sintered . . . 100,000 psi after heat treatment. Less than .004% shrinkage from die size at 6.4 density. Available in quantities up to and including 12 tons or multiples. Can be used with existing operating equipment. Mail coupon for technical data sheet.



**MAJOR 880 TITANIUM USES** are (1) fixed outboard nacelle assembly—107.8 pounds per nacelle, 215.6 pounds per airplane; (2) lip assembly anti-icing nose cowl—53.8 pounds per nacelle, 215.2 pounds per airplane; and (3) right hand access door assembly—41.2 pounds per nacelle, 164.8 pounds per airplane. Republic supplies a major portion of the 870 pounds of titanium that goes into each Convair 880.

**STEEL**

*and Steel Products*

**REPUBLIC STEEL CORPORATION**
**DEPT. ST -7818**
**1441 REPUBLIC BUILDING • CLEVELAND 1, OHIO**

| Have a metallurgist call: | Send more information on: |
|---|---|
| ☐ Alloy Steel | ☐ Alloy Steel |
| ☐ Stainless Steel | ☐ Stainless Steel |
| ☐ Titanium | ☐ Titanium |
| ☐ Type HS6460 Metal Powder | ☐ Type HS6460 Metal Powder |

Name_____ Title_____

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# NEW FROM KIDDE!

2½-gallon pressurized water

2½-gallon anti-freeze (loaded stream)

## The easiest-to-operate portable fire extinguishers on the market today!

Here, for the first time, is a practical, sensible design for pressurized water and loaded stream extinguishers. No inverting, no bumping, no valves to turn, no pins to pull (safety lock automatically releases when nozzle removed).

These two new stainless steel Kidde portables feature simple, one-two operation—just aim at fire and push the button. Notice the way the hose is stored, safely out of the way. Notice the wide-open handle—to insure fast action even in gloved hands. Notice the dust-and-waterproof pressure gauges—which show at a glance whether the units are fully charged. All of the features—plus the slim design and light weight of these Kidde portables—make them the easiest-to-store, easiest-to-carry, easiest-to-operate portables on the market today.

Approved by Underwriters' Laboratories. Available in pressurized water for fires in ordinary combustibles, or anti-freeze loaded stream for fires in ordinary combustibles and flammable liquids. For more information, write to Kidde today.

**Kidde** (K Kidde)

**Walter Kidde & Company, Inc.**
**660 Main St., Belleville 9, N. J.**
Walter Kidde & Company of Canada Ltd.,
Montreal—Toronto—Vancouver

*The words 'Kidde', 'Lux', 'Lux-O-Matic', 'Fyre-Freez' and the Kidde seal are trademarks of Walter Kidde & Company, Inc.*


## CALENDAR
### OF MEETINGS

**June 15-17, American Nuclear Society:** National meeting, Gatlinburg, Tenn. Society's address: 86 E. Randolph St., Chicago 1, Ill. Executive secretary: Octave J. Du Temple.

**June 15-18, American Electroplaters Society:** Annual meeting and industrial finishing exposition, Statler-Hilton and Sheraton-Cadillac Hotels, and Detroit Artillery Armory, Detroit. Society's address: 445 Broad St., Newark 2, N. J. Executive secretary: John P. Nichols.

**June 16-19, American Marketing Association:** National conference, Statler-Hilton Hotel, Cleveland. Association's address: 27 E. Monroe St., Chicago 3, Ill. Executive director: William C. Gordon Jr.

**June 21-23, Alloy Casting Institute:** Annual meeting: Homestead Hotel, Hot Springs, Va. Institute's address: 286 Old Country Rd., Mineola, N. Y. Executive vice president: E. A. Schoefer.

**June 21-24, Drop Forging Association:** Annual meeting, Essex and Sussex Hotels, Spring Lake, N. J. Association's address: Public Square Bldg., Cleveland 13, Ohio. Executive vice president: Dwight M. Allgood.

**June 21-26, American Institute of Electrical Engineers:** Summer meeting, Olympic Hotel, Seattle, Wash. Institute's address: 33 W. 39th St., New York 18, N. Y. Secretary: N. S. Hibshman.

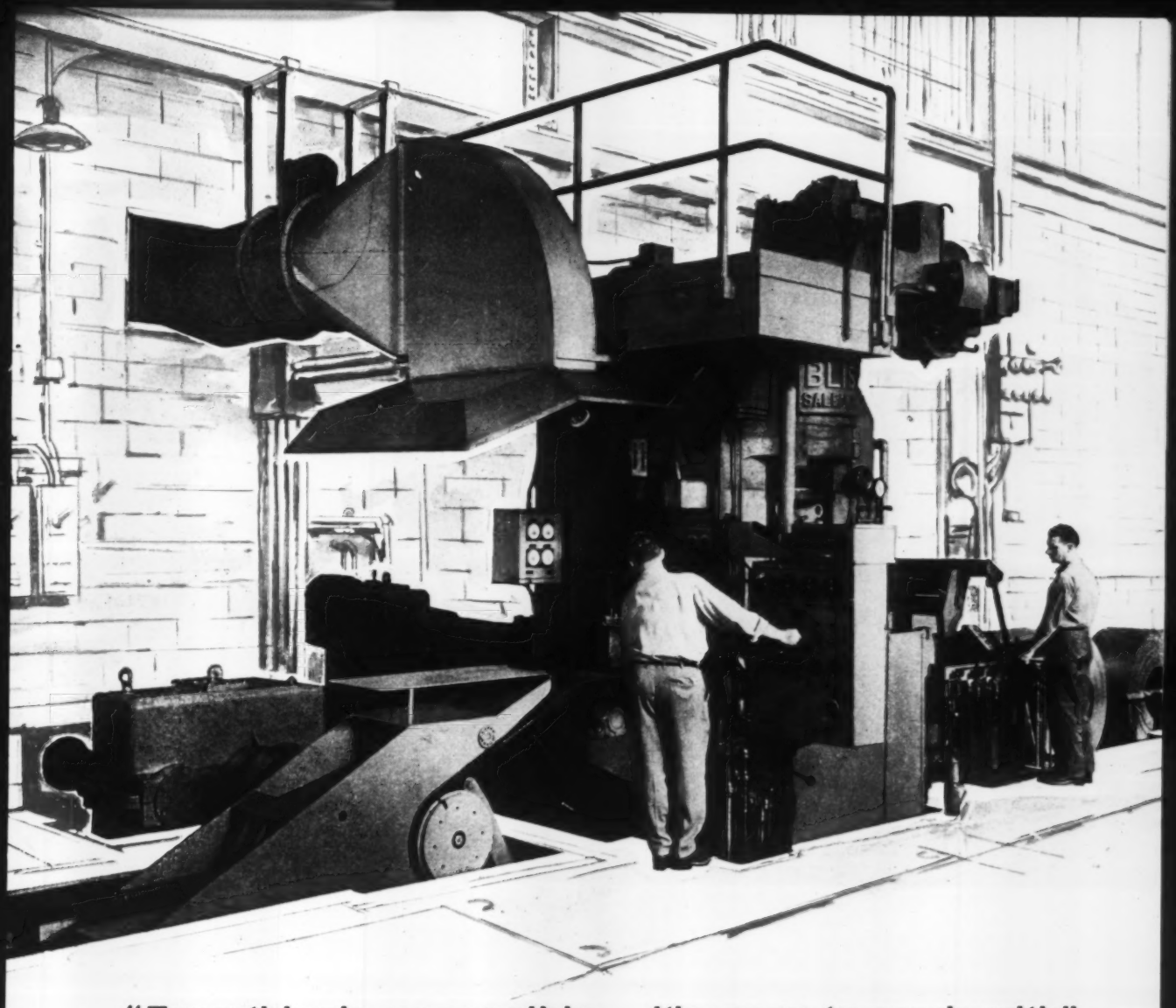
**June 22-23, Powder Metallurgy Parts Manufacturers Association:** Membership and directors meeting, Skytop Lodge, Pocono Mountains, Pa. Information: Hanson & Shea Inc., 1 Gateway Center, Pittsburgh 22, Pa.

**June 22-26, Air Pollution Control Association:** Annual meeting, Hotel Statler-Hilton, Los Angeles, Calif. Association's address: 4400 Fifth Ave., Pittsburgh 13, Pa. Executive secretary: Harry M. Pier.

**June 22-26, American Society for Testing Materials:** Annual meeting, Chalfonte-Haddon Hall, Atlantic City, N. J. Society's address: 1916 Race St., Philadelphia 3, Pa. Executive secretary: Robert J. Painter.

**July 13-15, Truck-Trailer Manufacturers Association:** Semiannual meeting, Homestead Hotel, Hot Springs, Va. Association's address: 710 Albee Bldg., Washington 5, D. C. Executive manager: John B. Hulse.

**July 29-Aug. 1, National Tool & Die Manufacturers Association:** Summer board meeting, Grand Hotel, Mackinac Island, Mich. Association's address: 907 Public Square Bldg., Cleveland, Ohio. Executive vice president: George S. Eaton.



## "Everything's accessible... it's easy to work with" says Thompson Wire of its new one way cold mill

The operating men at Thompson Wire's Sparrows Point plant especially appreciate the accessibility of controls on their Bliss one way cold mill. That's easy to understand when you realize that they use the mill to convert a wide variety of material ranging from ordinary carbon steels to "aircraft quality" and special saw blade steels.

The gages they roll range from .015" to .125", the widths from 14" to 20". The speed of the mill varies, of course, with the steels being rolled, but its top average running speed is about 1000 fpm. Bliss supplied the mill with complete entry and delivery equipment – entry coil ramp, mandrel-type payoff reel, coil hoist and positioner, combination pinch roll and flattener, tension reel coil buggy and belt wrapper.

Because, among other reasons, the average number of passes were low in Thompson's case, the one way mill proved a more economical choice than a reversing mill. In other cases, the opposite has been true. For examples of both, and of other Bliss equipment, write for our new 84-page brochure.

BLISS
SINCE 1857

*Bliss is more than a name... it's a guarantee*

**E. W. BLISS COMPANY, Rolling Mill Division, Salem, Ohio**

**Subsidiary: The Matteson Equipment Company, Inc., Poland, Ohio**

*Introducing...*

# FEDERAL'S NEW TRIM-LINE PRESS WELDERS

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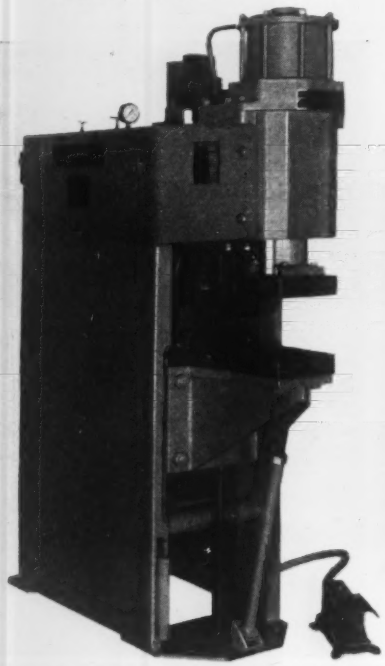
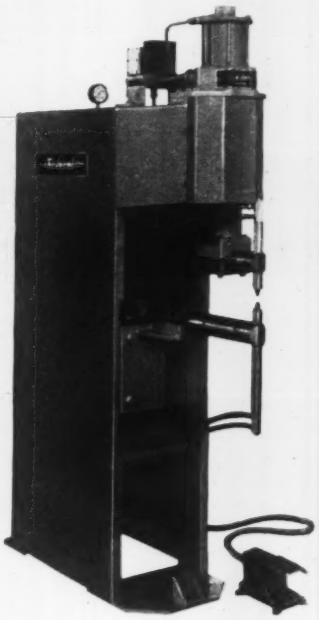
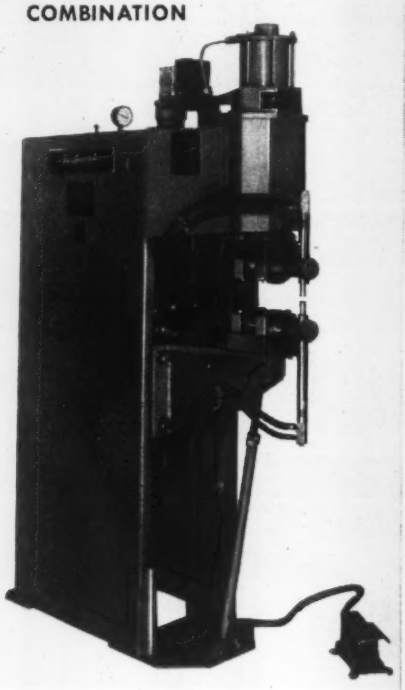


SPOT



COMBINATION



## *Available from stock in four sizes in capacities of 30 to 500 K.V.A.*

Completely new . . . these advanced design trim-line press welders will give you maximum production in a minimum floor area. What's more their compact, simplified design assures easier operation, less maintenance and ready accessibility.

Designed and built by Federal, one of the largest and most experienced resistance welder manufacturers, these new welders are available from stock as spot welders with horns, projection welders with platens, or combination spot and projection welders. Each type is available in a full range of standard throat depths, welding forces and transformer sizes.

Many standard automatic welding attachments are available to increase production with these standard machines.

Listed below are some of the features. For more information get in touch with the Federal representative nearest you. Ask for Bulletin P-59 and Special Tooling Bulletin AWA-59.

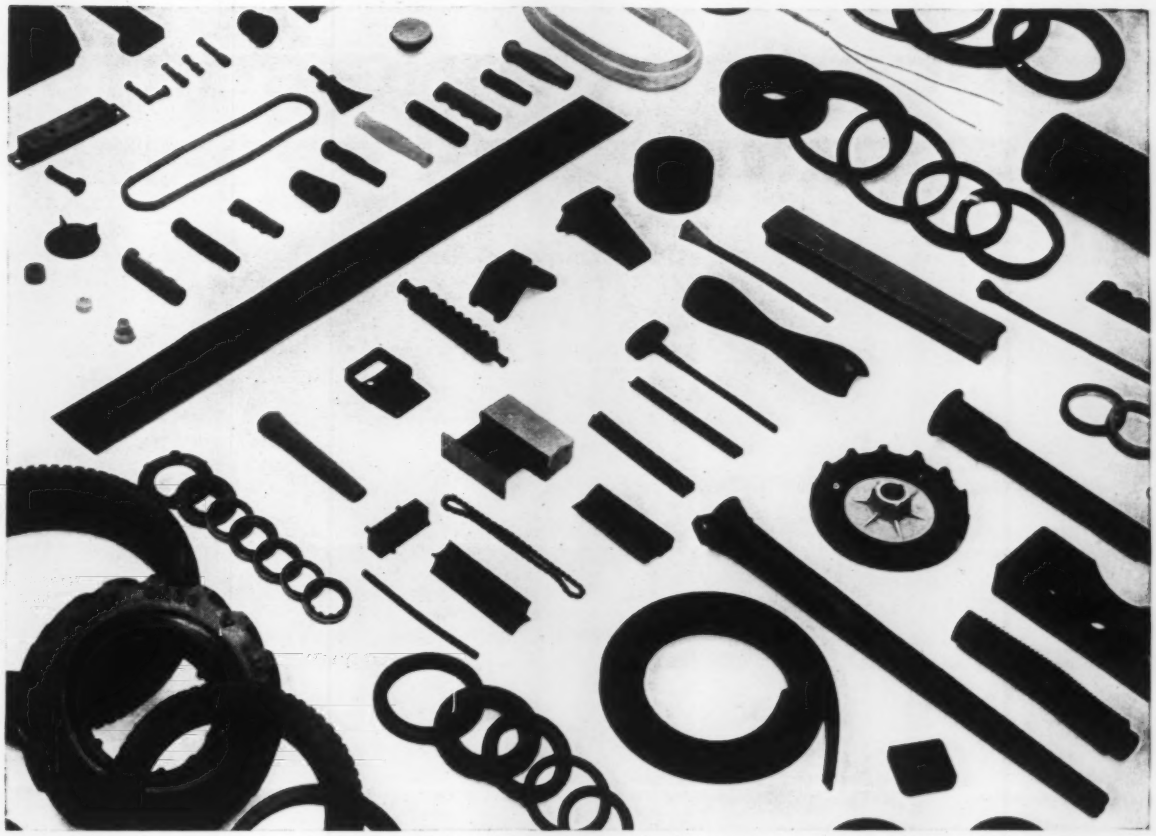
**COMPLETELY ALL NEW DESIGN FEATURING:**

- **New One Piece Frame** . . . stronger, less floor area, greater accessibility.
- **New Anti-Friction Slide** . . . hardened and ground slideweighs —eight anti-friction roller mount gives maximum stability —permanently lubricated rollers—simple adjustment.
- **New Steel and Copper Lower Arm** . . . minimum deflection—easier to adapt for special tooling.
- **Stock Models** . . . all components built for stock, quick delivery.
- **No Price Increase** . . . superior design at low cost.

**Federal / Warco**

**THE FEDERAL MACHINE AND WELDER CO. • WARREN, OHIO**

AFFILIATED WITH BERKELEY-DAVIS, INC., DANVILLE, ILLINOIS, MANUFACTURERS OF AUTOMATIC ARC WELDING EQUIPMENT



Tailor-made rubber and flexible vinyl parts produced through Ohio Rubber "Customeering" for original equipment in every industry.

# How OHIO RUBBER fashions more profitable PARTNERSHIPS

An Ohio Rubber "Customeering" engineer may start with your blueprint, but he begins saving you money *after* he checks your performance requirements—what you need, where and how you'll be using your component part.

Your savings start with his recipe for the material which goes into your part. Only the essential properties required for the better performance of *your* product will be included—you will not be buying properties you don't need.

The ORCO engineer's recommendations for feasible design modifications will further help produce a better part, frequently at big savings to you.

Combined with Ohio Rubber's integrated mold and die service, complete facilities for molding, extruding, and bonding to metal, here's a profitable partnership you may want to consider for your custom-made parts of rubber, synthetic rubber, silicone rubber, polyurethane, or flexible vinyl—one that offers all the advantages of single source control and responsibility.

Suggestion: The more complete story behind Ohio Rubber's long-standing and profitable partnerships with leading original equipment manufacturers is more fully told in ORCO Bulletin 715. Write for your free copy today! 9MP1

ORCO

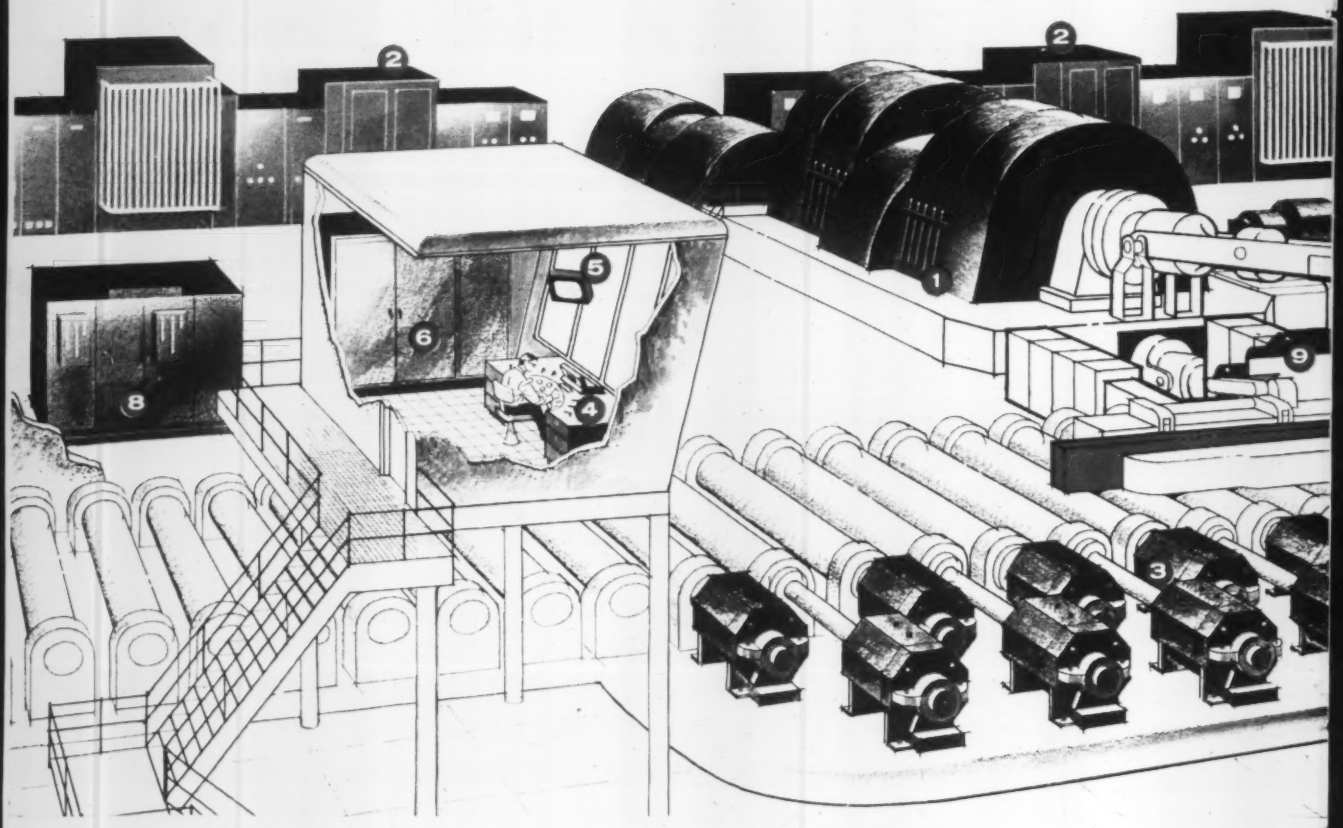
**THE OHIO RUBBER COMPANY**

**WILLOUGHBY, OHIO**

A DIVISION OF THE EAGLE-PICHER COMPANY

*General Electric's new program for Automation through Modernization can help you . . .*

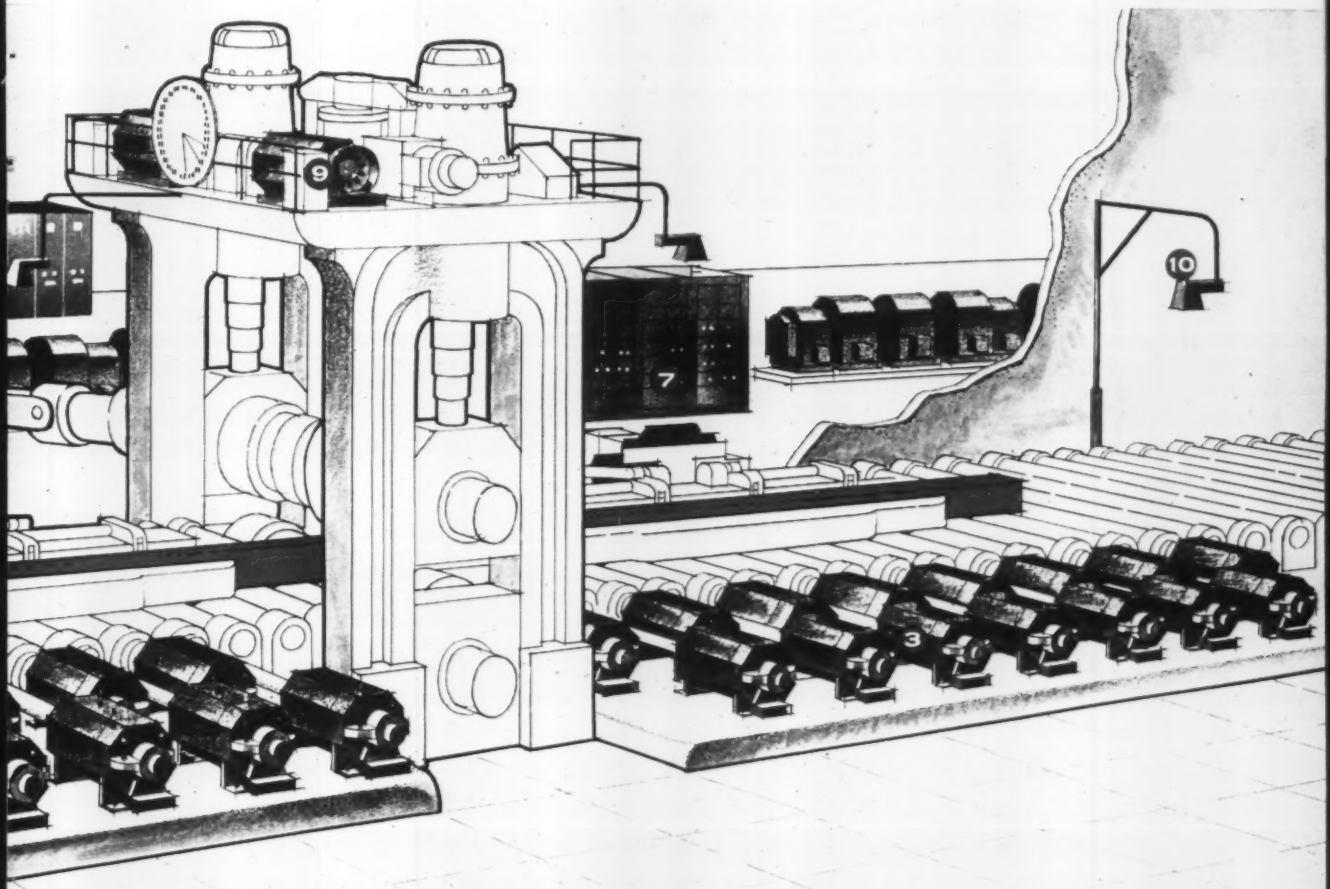
# REDUCE OPERATING COSTS, MODERNIZE FOR PROFITS



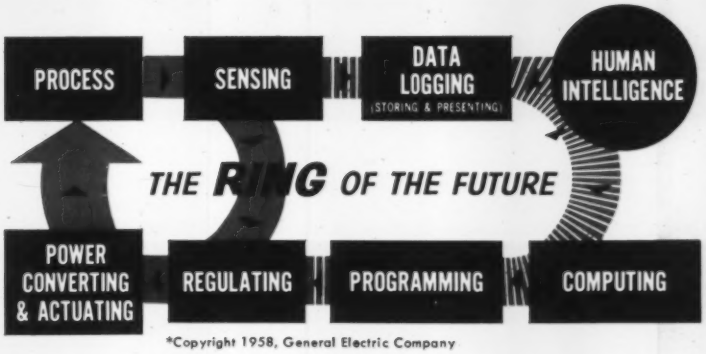

**Above is General Electric's version of a completely automated reversing hot mill. While your facility may differ, the products and technology for automation are available from General Electric today.**

1. ***"TOP-FORWARD"*** arrangement of main drive motors combines accessibility and easy maintenance features with reduced installation and construction costs.
2. Either mercury-arc rectifiers or motor-generator sets, depending upon operating conditions, provide reliable d-c power to main drive motors.
3. MD-600 motors power individual rolls, eliminate reduction and bevel gears, lower maintenance.
4. Operator's control console provides finger-tip control of entire mill operation.
5. Closed-circuit TV gives operator visual contact with remote and inaccessible mill operations.
6. Data processing equipment can record data, set up operating guides, and ultimately control the process using the GE 312 general purpose, digital control computer.
7. Main mill control utilizes quick-response *DIRECTO-MATIC* static control to provide specific direction during the short time required for mill reversals.
8. *DIRECTO-MATIC* static program control equipment provides fast, precise control of system operations based on pre-determined schedules.
9. Rugged MD-600 motors provide instant response and minimum of maintenance to the most vital mill operation.
10. Hot metal detectors note when metal is "in zone," initiate next step in operation. This saves rolling time, increases accuracy.

Implementation of General Electric's "Ring of the Future" will take you through the comparatively low-cost steps of modernization to practical automation of your reversing hot mill. Increased process and system efficiency will result in reduced operating costs. Greater speed and more precise control will minimize your non-productive rolling time, increase yield. For full information on Automation through Modernization, write today for General Electric's "Ring of the Future"* kit.




**THE "RING OF THE FUTURE" KIT IS GENERAL ELECTRIC'S GUIDE TO AUTOMATION THROUGH MODERNIZATION.**

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TO: SECTION 804-2
GENERAL ELECTRIC COMPANY
SCHENECTADY 5, NEW YORK

Please send me G.E.'s "Ring of the Future" kit.

Name _____

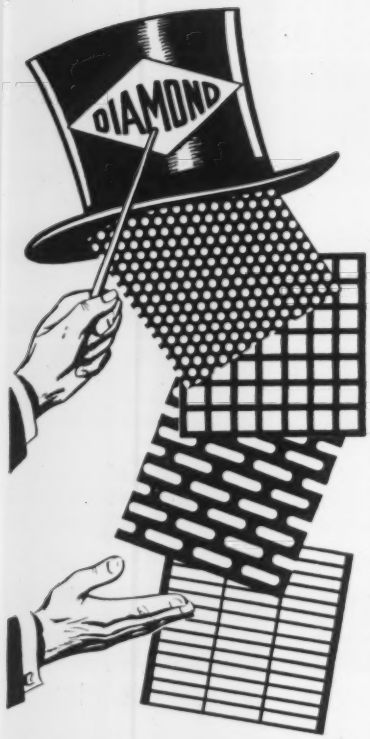
Position _____ Company _____

Address _____

City _____ State _____

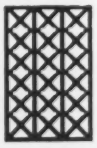
*Automation Through Modernization*

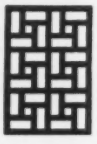
GENERAL ELECTRIC

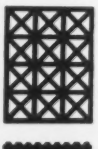



# Top-Hat Quality IN Perforated Metal

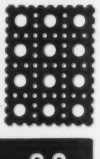
The popular Diamond Perforated-metal patterns shown above are only a few of the many illustrated and described in our 32-page Catalog No. 39. All of these standard patterns are available in a wide range of unit-opening sizes and we are always equally pleased to quote on original designs of any type or size.







Catalog 39 also illustrates and describes our high-quality lines of *Ornamental Cane*, Perforated-Metal Sheets for Accoustical installations and Heavy-Duty Architectural Grilles. Write, today, for a free copy.



**Correspondence is especially invited regarding ANY requirement for perforated-metal panels or parts. We are equipped to fabricate special sections to any desired extent and welcome opportunities to make money-saving suggestions.**

**DIAMOND MFG. CO.**
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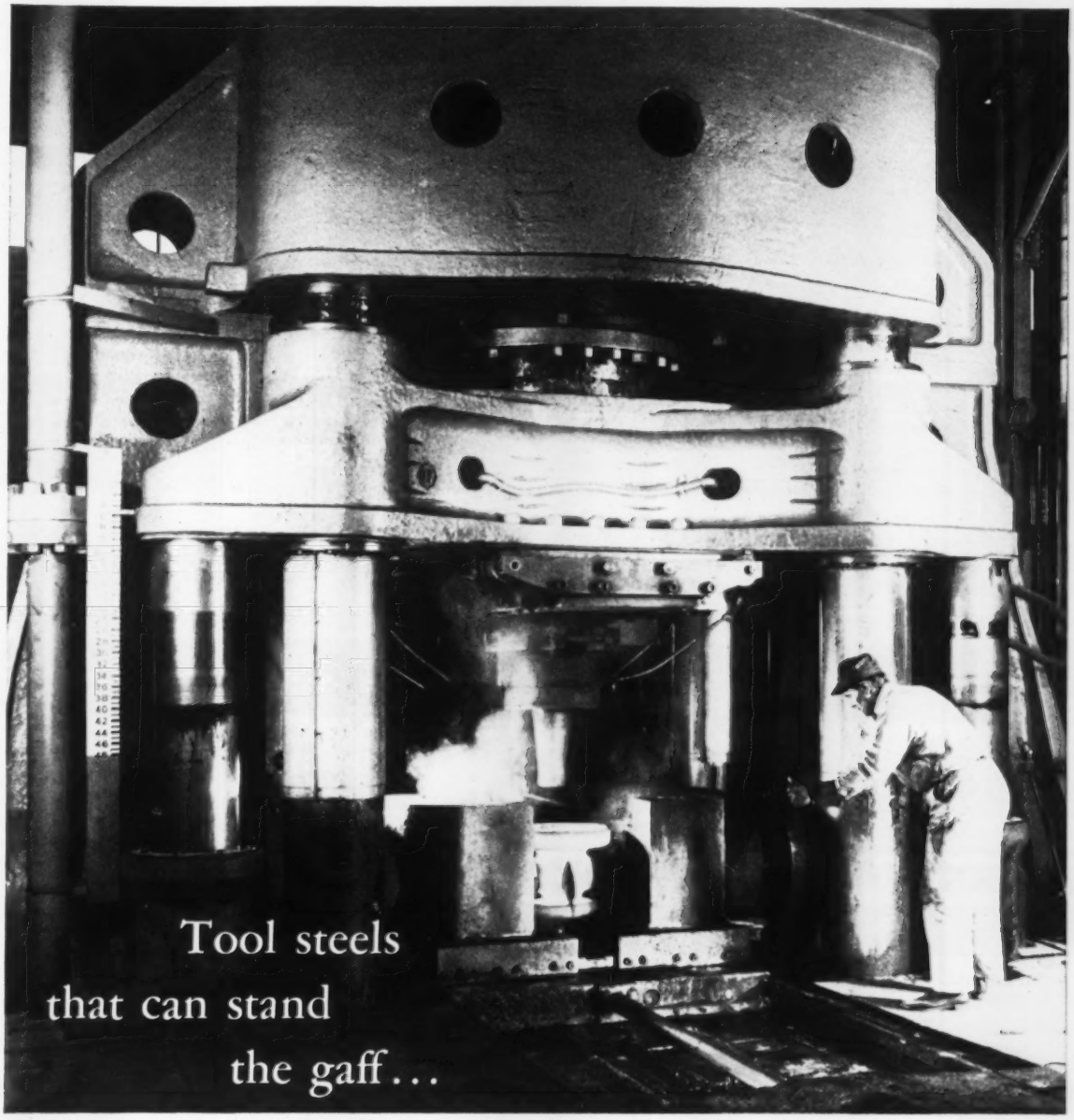


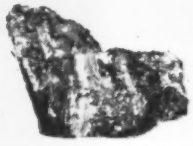

**...depend on Vancoram Vanadium!** No other alloying element has proved so dependable and versatile for use in tool and die steels, as well as other specialty steels, irons and metals where long life and top performance are essential. Vanadium controls grain size, improves strength and toughness, and provides excellent cutting and wearing characteristics. Regular constructional steels and irons, deep drawing steels, large forgings, and steel and iron castings greatly benefit from the addition of just a small amount of vanadium. Let your nearest VCA office tell you more about Vancoram vanadium products . . . and their many advantages and economies. Vanadium Corporation of America, 420 Lexington Avenue, New York 17, N. Y. • Chicago • Cleveland • Detroit • Pittsburgh

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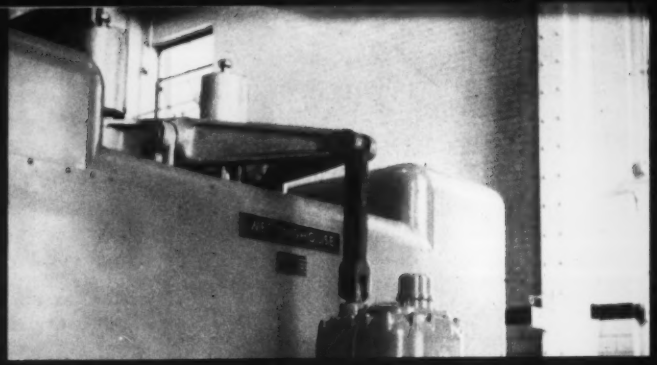

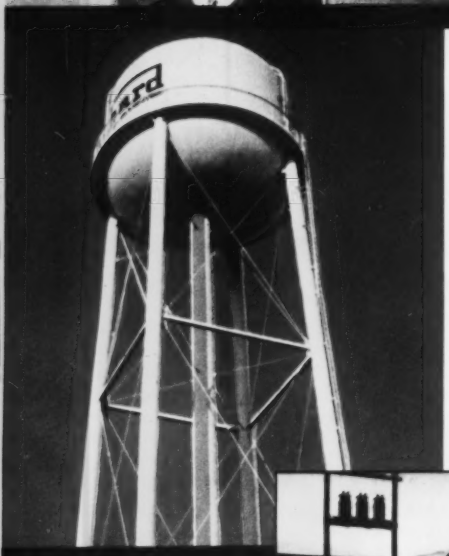

Bright, modern, functional

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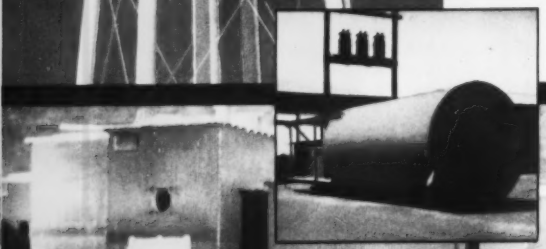

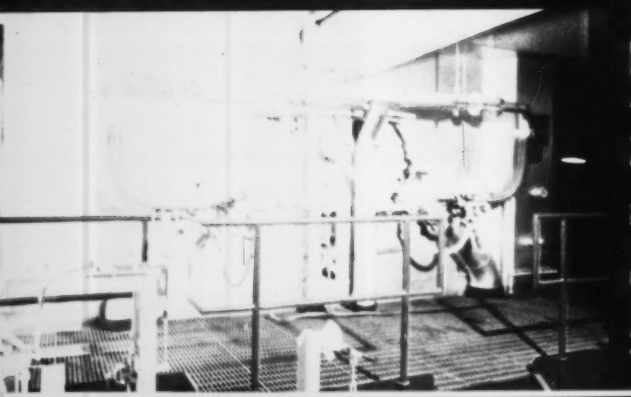

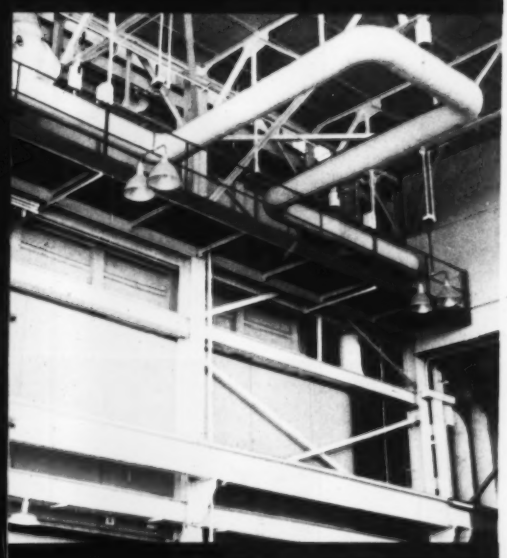

# ...another important **Difference** in the Rust-Oleum System

How many coating manufacturers offer you a *complete system* that Stops Rust—and provides lasting beauty over the years? The Rust-Oleum *System* does just that.

*First*—apply Rust-Oleum 769 Damp-Proof Red Primer directly over the sound rusted surface, after scraping and wirebrushing to remove rust scale and loose rust. The *specially-processed* fish oil vehicle in the primer penetrates rust to bare metal—merging the rust into the coating—saving costly surface preparations. *Second*—the wide variety of colors in Rust-Oleum finish coatings provides lasting beauty over the primer. Your choice of practically all colors from bright enamels to soft, restful pastels—all formulated for long over-the-years protection.

What is your coating problem? From Heat Resistant, Chemical Resistant, and Machinery Finishes to Heavy-Duty Top Coatings for use indoors and out—Rust-Oleum has the coating to meet your needs and the *system* for lasting beauty. Consult your Rust-Oleum Industrial Distributor . . . he has complete stocks for your use in maintenance, new construction, and remodeling. His experience can serve you well.

A matter of excellence.
Distinctive as your own fingerprint.

# RUST-OLEUM®

# STOPS RUST!®

RUST-OLEUM IS AVAILABLE IN PRACTICALLY ALL COLORS

SEE OUR CATALOG IN SWEET'S
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## STOP RUST

with
**RUST-OLEUM**
**769 Damp-Proof Red Primer**

Eliminate costly surface preparations and save time, money, and metal. Just brush Rust-Oleum 769 Damp-Proof Red Primer right over the sound rusted surface—after scraping and wirebrushing to remove rust scale and loose rust. You can do this because the **specially processed fish oil vehicle** penetrates rust to bare metal—as proved by radioactive tracing studies.

**SEND FOR FREE TEST SAMPLE! ATTACH TO YOUR LETTERHEAD!**

**Rust-Oleum Corporation**
**2982 Oakton Street, Evanston, Illinois**

Please send me the following at no cost or obligation:

- ☐ Free test sample of Rust-Oleum 769 Damp-Proof Red Primer for rusted metal surfaces.
- ☐ Complete literature with applications and color charts.
- ☐ Information on matching special colors.
- ☐ Thirty-page report on Rust-Oleum fish oil penetration.

# How steam treating affects ferrous and non-ferrous metals

Use of steam atmosphere is nothing new to industrial processing but the benefits to be realized from its application in the heat treating of metals have only begun to be explored in the past few years . . . and are currently attracting an increasing amount of attention.

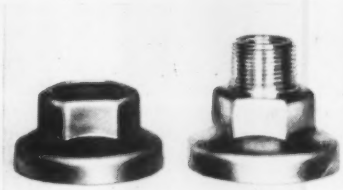
In scores of plants, working with both ferrous and non-ferrous metals, steam treating has proved an outstanding cost-cutter, according to F. L. Spangler, Application Engineer.

*These trays of sewing machine parts are loaded for steam treating to give them a uniform, blue-black, wear-resistant finish. Since replacing the previously used bath method, steam treating has resulted in a 90% saving in direct labor and a reject problem has been eliminated.*

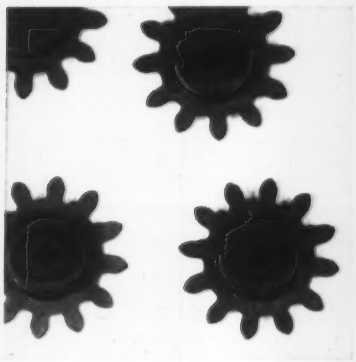
**On high-speed steel** cutting tools, for instance, it keeps tools sharp longer. Many drills, reamers, hobs, milling cutters, broaches, saws and similar tools hold their cutting edges 50 to 100% longer when steam treated after tempering and final grinding. This ratio goes up . . . often as high as 6 to 1 . . . when cutting such extra tough materials as alloyed structural steels.

**On powdered iron parts,** compressive strength and hardness increase appreciably. Tests of steam treated sintered compacts indicate that yield point under compression is twice that of a regular sintered compact.

**To structural steel** steam treating gives a uniform, corrosion-resistant, blue-black finish. When steam treating replaces chemical surface treatment, costs are usually 20 to 25% less . . . where it is used for stress relieving or tempering prior to machining or grinding, a shot or sand blasting operation can be eliminated.



*These brass radiator steam-vent shells require nine draws and four anneals. Prior to use of a steam Homo furnace, a pickle was necessary after each anneal and a heavy pickle and buffing before final chrome plating. With steam treating the manufacturer has been able to eliminate all pickling . . . now uses only a bright dip and has substantially cut buffing time.*



*Powdered iron gears measuring 1⅛" in diameter were tested for hardness on a standard Rockwell machine, before and after steam treatment. After steam treating, ten parts tested showed an average increase in hardness of 43% on the gear teeth . . . 112% on gear hubs . . . and a 26% increase in compressive breaking load.*

**On gray iron castings** steam seals microscopic porosity, improves resistance to wear and gives a high degree of corrosion resistance. Salt spray tests indicate that parts so treated stand up as well or better than cadmium plated ones.

**Applied to non-ferrous metals** . . . brasses, bronzes, beryllium copper, aluminum, etc. . . . it produces scale-free work ready for bright dip or use as-is. Within the past few years many manufacturers have substantially reduced and in some cases eliminated cleaning operations by stress-relieving, drawing, solution-treating or age-hardening in a steam atmosphere instead of air.

The equipment for this highly versatile heat treating method is safe and inexpensive...is ideal for installation directly in production lines.

**A new 24 page catalog,** *The Homo Method of Steam Atmosphere Heat Treating, gives details about application of the method to a variety of parts and materials. These specific instances may suggest ways in which this unique method can go to work for you to improve product quality . . . eliminate needless operations . . . reduce costs. Just write to Leeds and Northrup Company, 4957 Stenton Avenue, Philadelphia 44, Pennsylvania and ask for Catalog TD2-620(1).*

**LEEDS NORTHRUP**
Instruments Automatic Controls • Furnaces

# Man-made diamonds add the newest "Touch of Gold" value to carbide grinding

In carbide grinding the product-improving, cost-cutting "Touch of Gold," created by Norton leadership in diamond wheel development, began back in 1930. Today, man-made diamonds are adding something new to the "Touch of Gold." Their use as abrasives is steadily increasing, because of their improved performance and economy.

Norton was first to introduce all three bond types of diamond wheels . . . manufactures with complete uniformity of specification . . . produces the largest line . . . and *certifies* the diamond content of each wheel. Today, similar pioneering continues Norton leadership in the use of man-made diamonds . . . bringing you better performance, longer service life and lower grinding cost for every dollar you spend. NORTON COMPANY, Worcester 6, Massachusetts.

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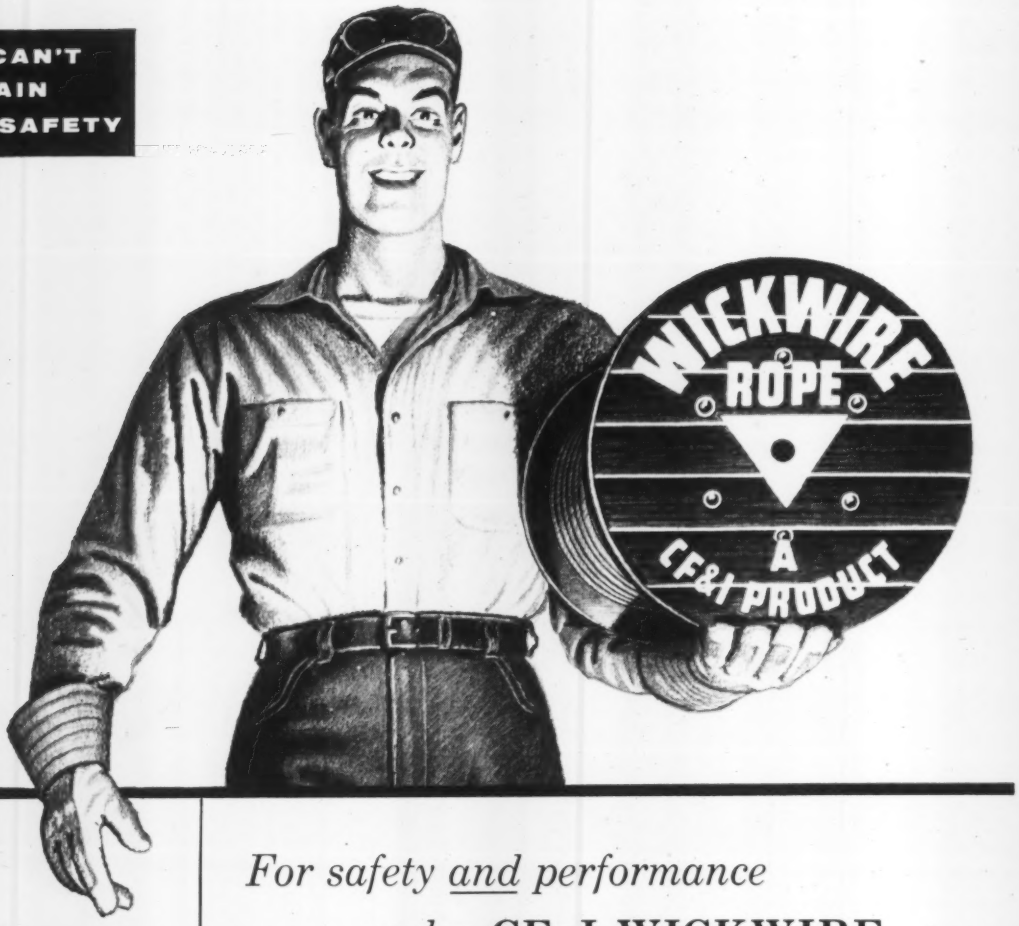
ABRASIVES

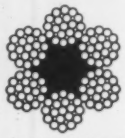
Making better products . . . to make your products better

**NORTON PRODUCTS:** Abrasives • Grinding Wheels • Grinding Machines • Refractories • Electrochemicals — **BEHR MANNING DIVISION:** Coated Abrasives • Sharpening Stones • Pressure Sensitive Tapes

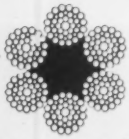
**YOU CAN'T BARGAIN WITH SAFETY**



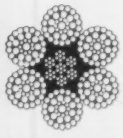

**WICKWIRE ROPES FOR INDUSTRIAL USE**



6 x 25 Filler Wire, FC



6 x 41 Filler Wire, FC



6 x 46 Filler Wire, IWRC

*For detailed recommendations, write the nearest CF&I sales office and ask for WR 722.*

## *For safety and performance . . . order* CF&I-WICKWIRE *"job-designed" wire ropes*

The Image of CF&I—a giant steelman—stands for the rigid quality-controls and testing procedures that are carried out in the production of Wickwire Rope. This Image also reflects CF&I's ability to design a specific product to meet a particular need.

These are the very reasons why CF&I-Wickwire Ropes are both *safe*—as only a *quality* wire rope can be—and *suitable*—because they are available in a *complete range* of wire grades, types, sizes and constructions, designed to meet each industry's requirements.

Avoid the losses—due to injuries and wrecked equipment—that can occur when a "bargain" rope fails. Buy a quality wire rope that's designed for the job it must do—a CF&I-Wickwire Rope.

**WICKWIRE ROPE**

**THE COLORADO FUEL AND IRON CORPORATION**

CF&I STEEL

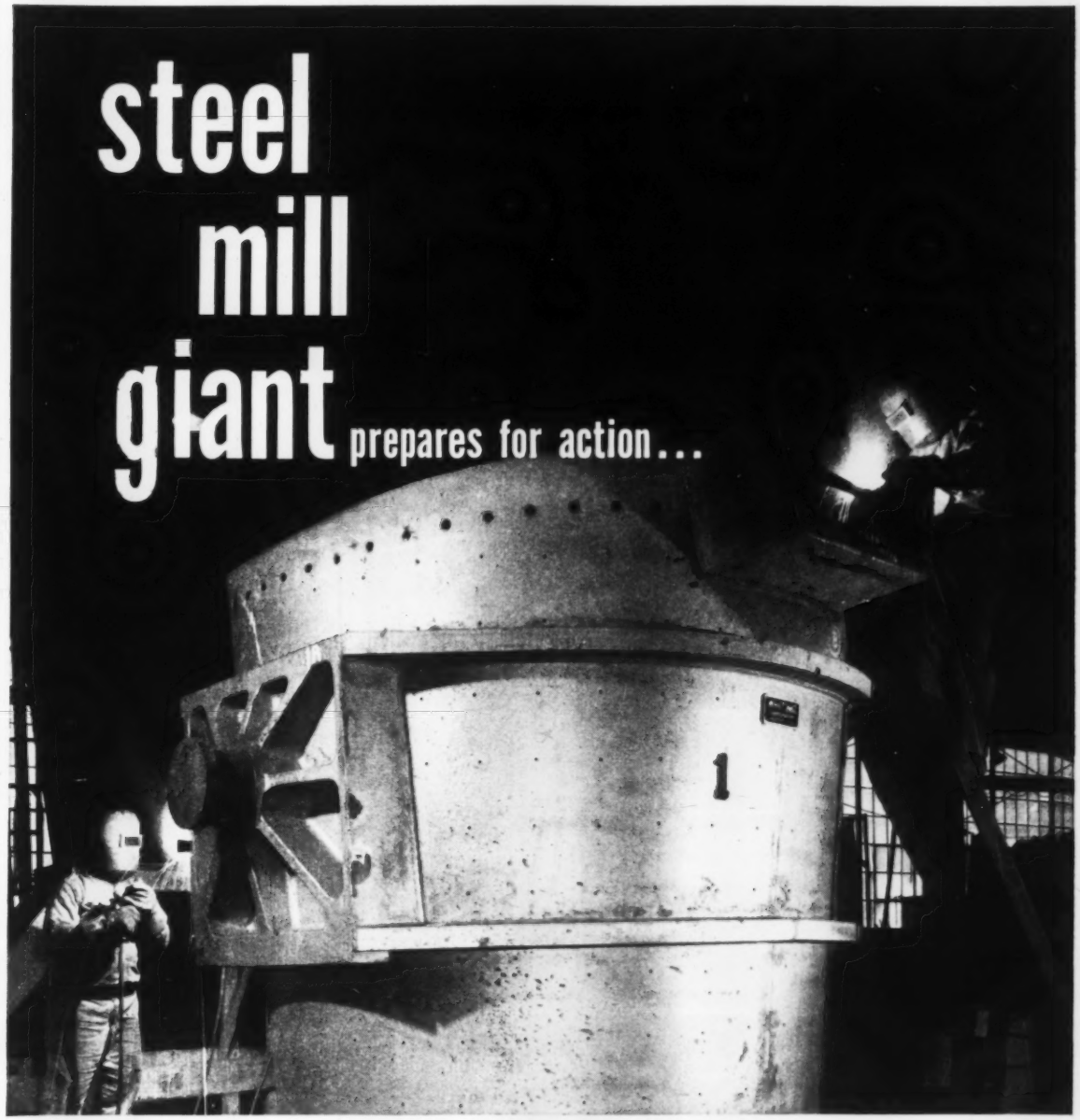
*In the West:* **THE COLORADO FUEL AND IRON CORPORATION**—Albuquerque • Amarillo • Billings • Boise • Butte • Denver El Paso • Farmington • Ft. Worth • Houston • Kansas City • Lincoln • Los Angeles • Oakland • Oklahoma City • Phoenix Portland • Pueblo • Salt Lake City • San Francisco • San Leandro • Seattle • Spokane • Wichita

*In the East:* **WICKWIRE SPENCER STEEL DIVISION**—Atlanta • Boston • Buffalo • Chicago • Detroit • New Orleans • New York Philadelphia

**CF&I OFFICE IN CANADA:** Montreal • **CANADIAN REPRESENTATIVES AT:** Calgary • Edmonton • Vancouver • Winnipeg

6794-G

# steel mill giant prepares for action...




Preparations are nearly complete . . . and soon this giant 60-ton ladle, built to A.I.S.E. specs, will be pouring out profit for another satisfied Whiting customer. Cast steel trunion bases, forged steel trunions, and adjustable swivel-type bottom tapping lever guarantee low maintenance . . . easy control . . . long, rugged service life. When you need ladles—capacities from 100 lbs. to 200 tons—specify Whiting!

**FREE CATALOG . . .** Describes over 200 ladle types and sizes. Write today!
*Whiting Corporation, 15643 Lathrop Avenue, Harvey, Illinois.*

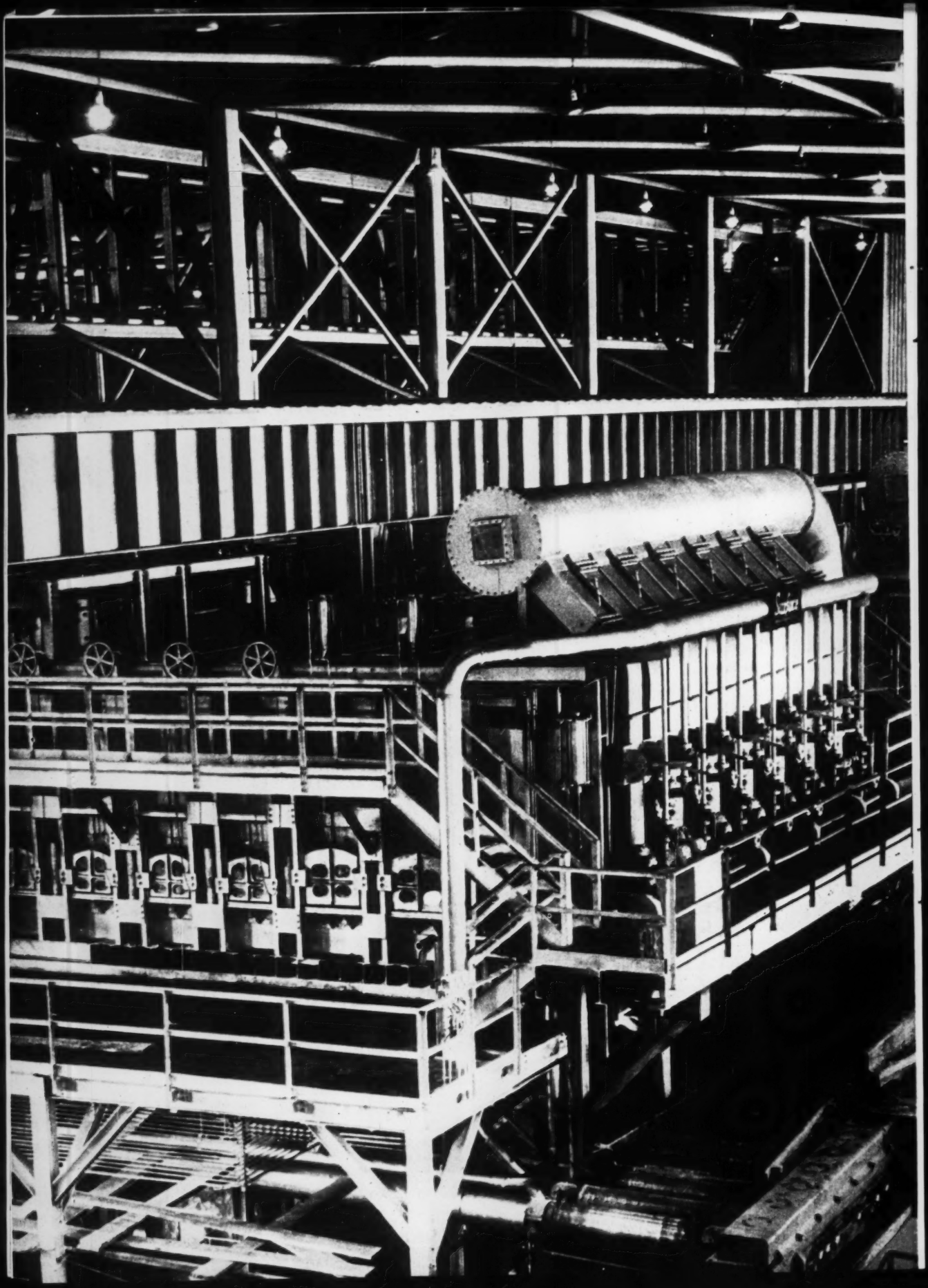
75th year

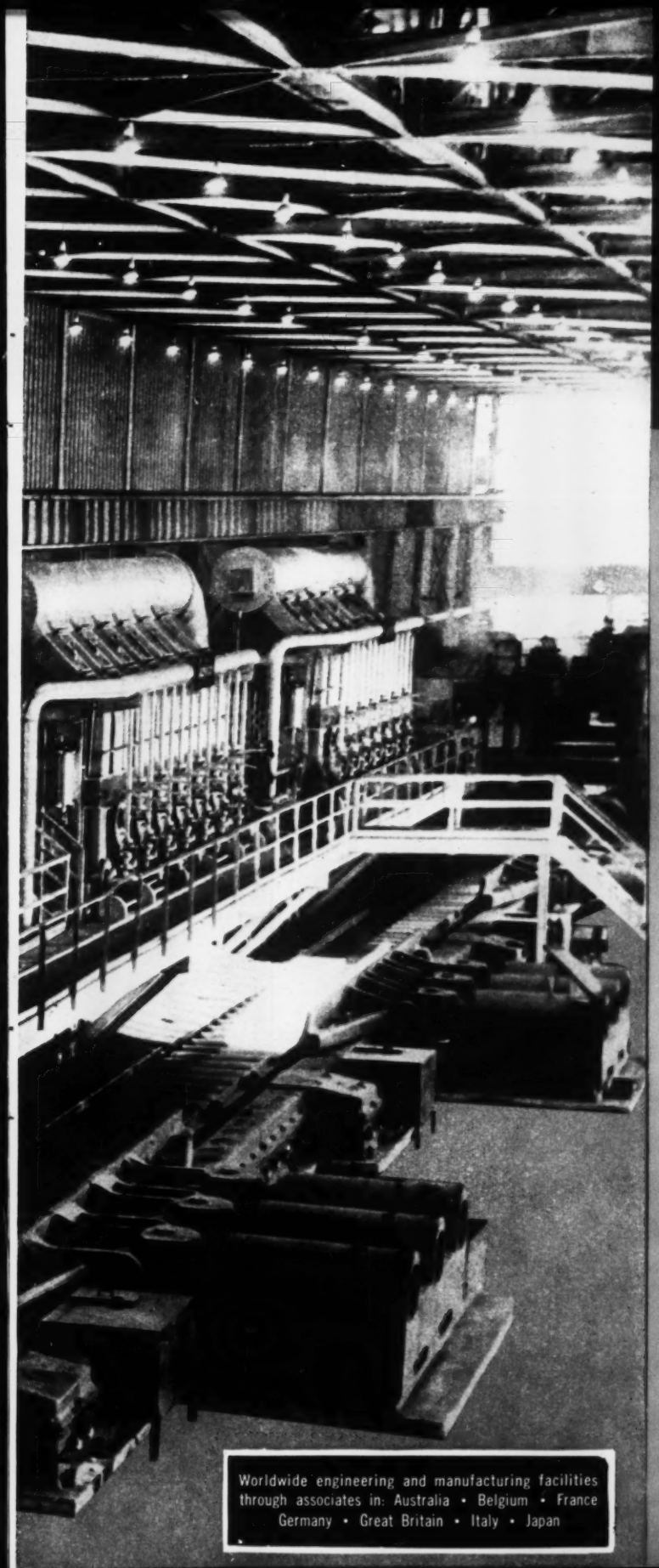
COST-SAVING EQUIPMENT . . . THE WAY TO HIGHER PROFITS

LADLES

# WHITING

MANUFACTURERS OF CRANES; TRAMBEAM HANDLING SYSTEMS; TRACKMOBILES; FOUNDRY, RAILROAD, AND SWENSON CHEMICAL EQUIPMENT





# 200 TONS AN HOUR

## CONTINUOUSLY

200 tons of steel slabs are heated to rolling temperature every hour, continuously, in each of these Surface monsters—world's largest slab furnaces.

No other furnace today can list all of these features:

1 Cantilever skid supports permitting unobstructed combustion space for underfiring.

2 Furnace lines and burner design which provide high heat input from the moment the slab enters the furnace.

3 Built-in control* to prevent intermingling of gases from upper and bottom zones, providing better control of heat application, and preventing overheated slab end.

4 Anticipatory control which reduces temperature head when rate of slab discharge decreases.

5 Air preheat up to 1100°F.

6 Television signal to pusher pulpit, informing operator of the exact position of the leading slab.

This is another demonstration that, at Surface, unconventional thinking and conventional experience are a productive team for the steel industry. Surface Combustion Corporation, 2408 Dorr St., Toledo 1, Ohio.

*patents pending

Surface

*wherever heat is used in industry*

Worldwide engineering and manufacturing facilities through associates in: Australia • Belgium • France Germany • Great Britain • Italy • Japan

# LINK-BELT SS CLASS DRAW BENCH CHAIN

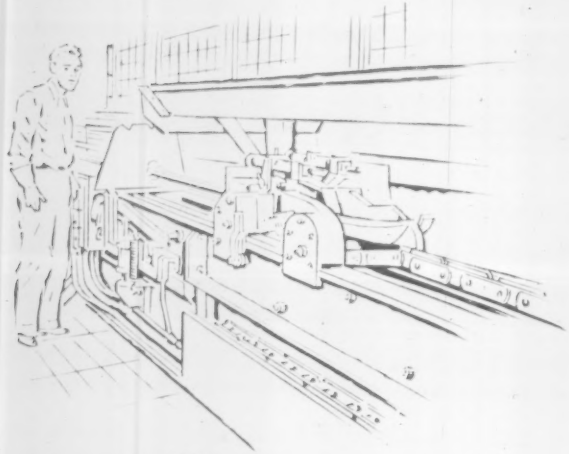
## gives longest chain life . . . resists highest chain pull

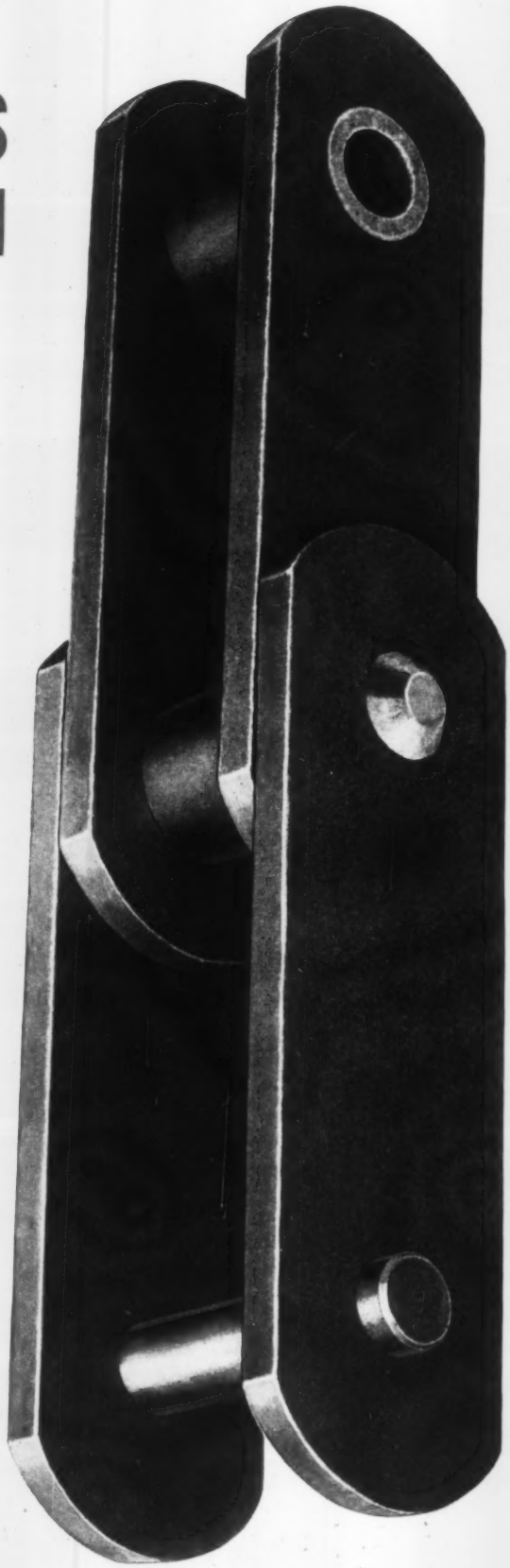
Link-Belt SS Class draw bench chains won't give in—whether they're used on benches having capacities of 5000 lbs., 100,000 lbs. or greater. Parts are accurately machined, after hardening, by a special process that assures longer chain life on even the highest chain pull applications.

These rugged chains, of all-steel construction, are available in a variety of pitches and strengths to suit any draw bench requirement. Chains, such as the one illustrated, have hardened pins, bushings and sidebars. Pins and bushings are securely locked in the sidebars by controlled press fits. Block type chain, with hardened pins and sidebars, is also available. Pins on this chain are also securely locked in the sidebars by controlled press fits and sprocket contacting surfaces of the block links are accurately machined to assure proper tooth engagement.

For further facts, call your nearest Link-Belt office or stock-carrying distributor, listed under CHAINS in the yellow pages of your phone book. Or write for our new comprehensive Catalog 1050.

15,067

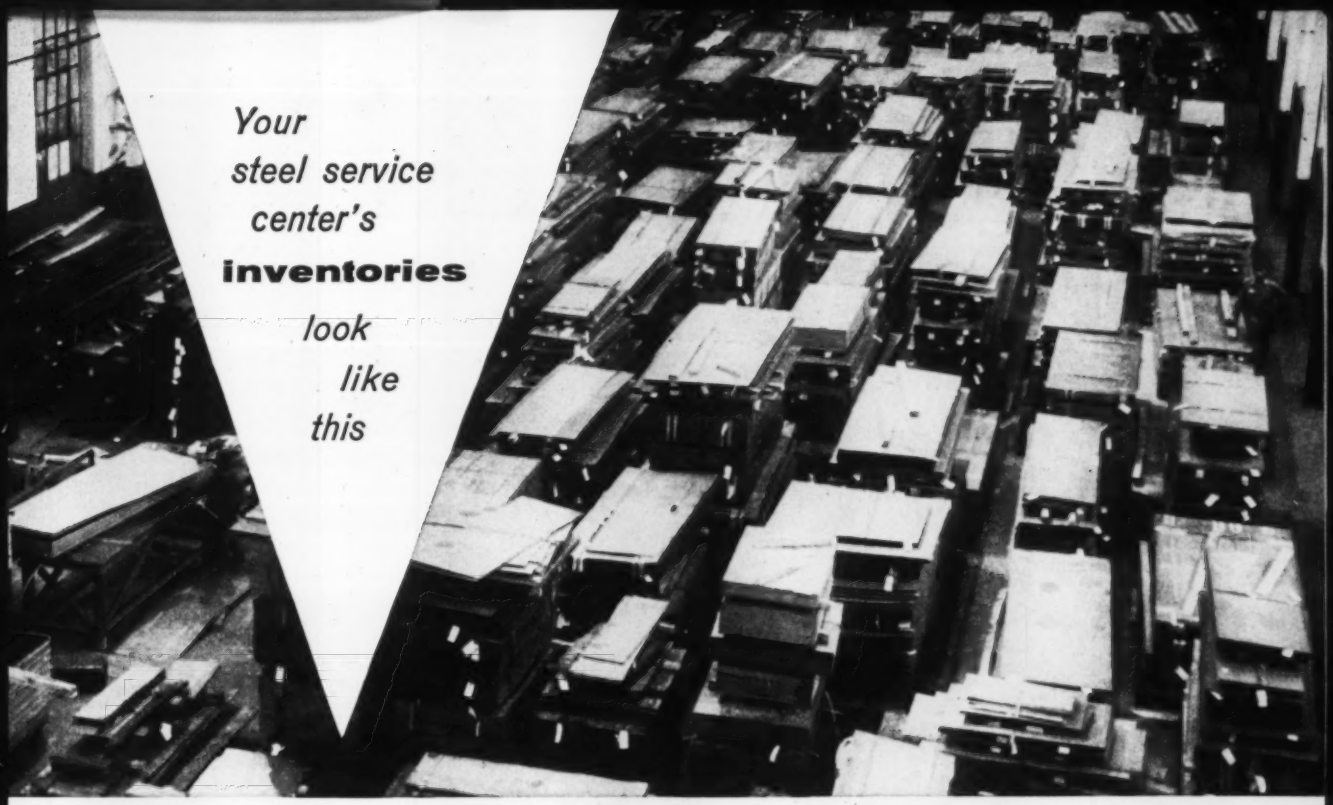




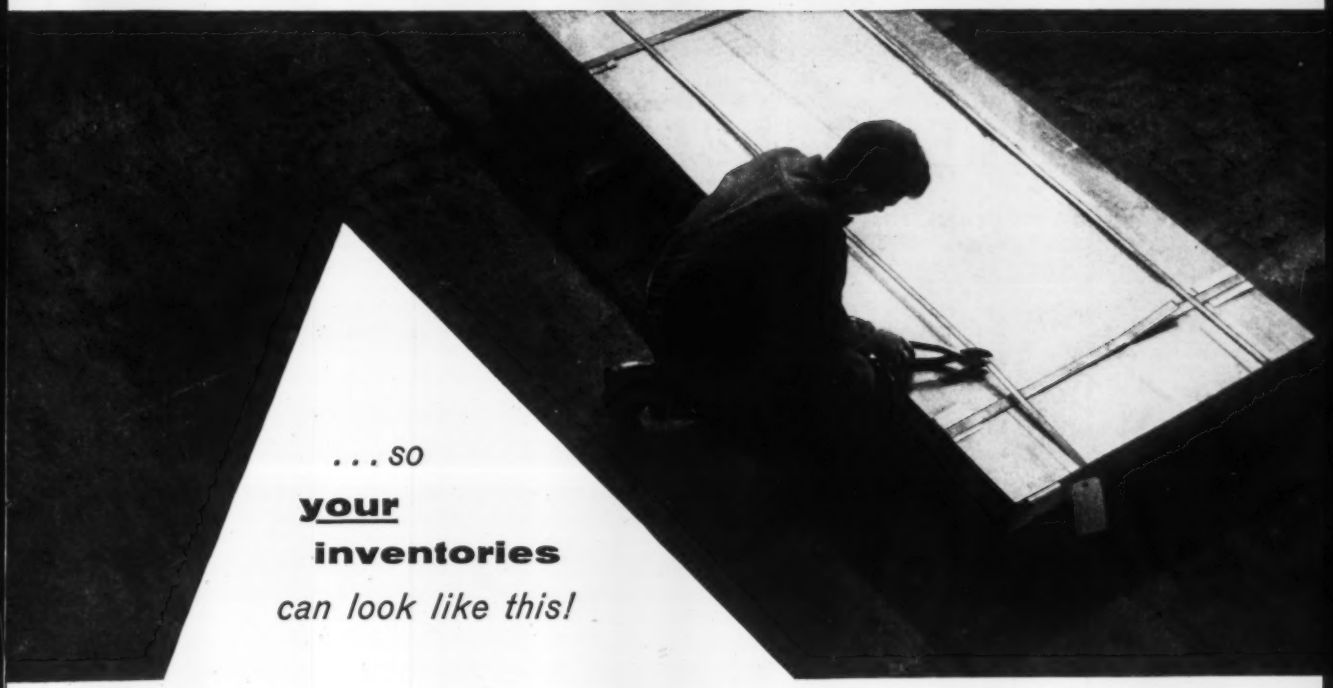
LINK-BELT

CHAINS AND SPROCKETS

LINK-BELT COMPANY: Executive Offices, Prudential Plaza, Chicago 1. To Serve Industry There Are Link-Belt Plants, Sales Offices, Stock Carrying Factory Branch Stores and Distributors in All Principal Cities. Export Office, New York 7; Australia, Marrickville (Sydney); Brazil, Sao Paulo; Canada, Scarboro (Toronto 13); South Africa, Springs. Representatives Throughout the World.




*Photos courtesy of The Universal Steel Company*




To cut inventory costs, make your Youngstown Warehouser your local "steel service center". Make full use of his complete local stocks, fast delivery service. His one-source service simplifies your purchasing and bookkeeping, too. You'll find him an efficient, time-saving, partner-in-production.

AMERICAN STEEL WAREHOUSE ASS'N

THE
**YOUNGSTOWN**
SHEET AND TUBE COMPANY
*Youngstown, Ohio*

*Manufacturers of Carbon, Alloy and Yoloy Steel*

# NOW YOU CAN GRIND AND FINISH

## NEW BAYFLEX DOUBLE-DUTY

*Illustrations above show Bayflex Double-Duty in action, held at correct angle for weld bead grinding (top) and for finishing (bottom)*

# WITHOUT CHANGING WHEELS!

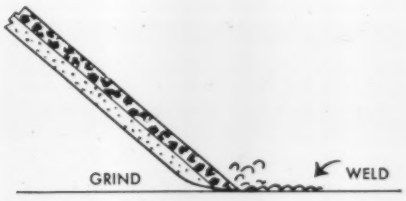
There are two important angles to consider before you buy new weld-grinding or finishing wheels. Bay State's new Bayflex Double-Duty raised hub disc-wheel has them *both!*

The "DD's" unique, two-layer construction gives you two grinding angles: One is 30° - 45° which gives you fast stock removal for grinding weld beads . . . and the other is 10° - 20° which gives you a finish without gouging, a finish so smooth it's just short of a polished surface.

The upper layer for weld grinding comes in a single, standard specification. The lower finishing or blending layer comes in your choice of five different grits (24, 36, 54, 80 and 120) for every type of finishing job from heavy steels through light stainless sheets to aluminum and copper.

Your Bay State representative is ready now to demonstrate the Bayflex Double-Duty in your plant under normal working conditions. Get in touch with him and see what he can do to cut costs and speed up your weld grinding. You'll find he's more than a good salesman . . . because he's an experienced abrasive specialist, too. *Better grinding at lower cost . . . that is his business.*

## IS 2 WHEELS IN 1



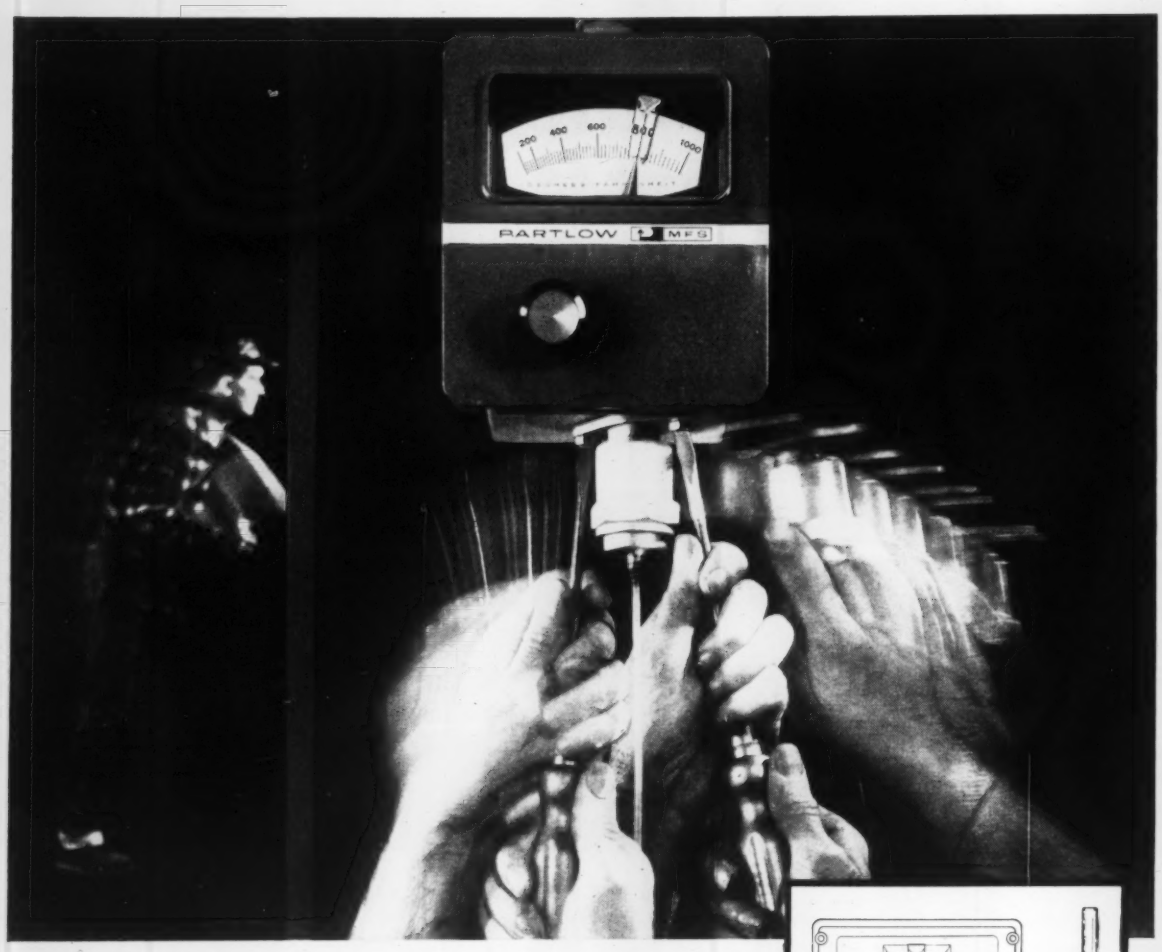

*Upper layer removes stock rapidly when disc is held at 30° - 45° angle.*

*Lower layer smooths and blends surface when held at 10° - 20° angle.*

# BAY STATE ABRASIVES

BAY STATE WHEELS of PROGRESS

Bay State Abrasive Products Co., Westboro, Mass.
*In Canada:* Bay State Abrasive Products Co., (Canada) Ltd., Brantford, Ontario.
*Branch Offices:* Bristol, Conn., Chicago, Cleveland, Detroit, Pittsburgh, Los Angeles.
*Distributors:* All principal cities




*The Temperature Control Designed for Fast*

## "DO IT YOURSELF" MAINTENANCE

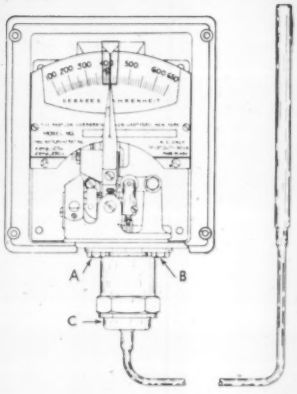
*Right on the Job!*

Rugged simplicity of design—along with the direct, positive power of mercury-actuation — combine to give Partlow maintenance and performance advantages no other type of temperature control can hope to equal.

Simplicity in the Partlow, for one thing, means that the control element can be changed *at the job site* in a matter of minutes with no other tool than a screwdriver . . . "Down time" is cut to an absolute minimum!

And simplicity in the Partlow also means the complete elimination of fussy electronic gadgets, delicate levers, hairsprings and other accessories that have a tendency to break down at the first trace of jar or jostle. Partlow controls are famous for their unfailingly accurate performance even under the most adverse operating conditions.

If you use or manufacture process equipment within the -30° to 1100° F. range, there's a Partlow pneumatic, electric or self-contained gas control (recording, indicating or non-indicating), to fit your application *precisely*. For details, write The Partlow Corp., New Hartford, New York. Dept. S-659.




*Diagrammatic view of the new MFS reveals "quick-change" feature common to all Partlow controls. In case of damage, merely unscrew at points (A) and (B), and remove element (C) from case. Reverse this process, and your Partlow is ready to resume operation.*

You can pay more but you can't buy better than

**PARTLOW**

**TEMPERATURE CONTROLS**

*Export Ad Auriema, Inc., 85 Broad St., New York 4, N. Y.*

# USERS OF **NEW**
# **ROEBLING HERRINGBONE* WIRE ROPE**
# HOLD THESE TRUTHS TO BE SELF-EVIDENT...

**That Herringbone is the most practical and *needed* wire rope development to come along in years.**

**Herringbone, the regular lay and Lang lay rope, is actually two-ropes-in-one rope. Thus, the qualities that make these two ropes *good* ropes, combine to make Herringbone *excellent*.**

## *HERE'S WHY:*

The steel core of Herringbone provides the *ideal* support for the two pairs of Lang lay and one pair of regular lay strands used in its construction. In addition, the outer wires are heavier for extra abrasion resistance, and good flexibility is maintained by the finer wires inside. This combination of features enables Herringbone to give *longer service* in most applications.

Herringbone has been used on a wide variety of excavating equipment and tough hoisting jobs with impressive results. Its applications are practically unlimited on installations which call for all-steel ropes and on many where fiber core ropes are now being used. Another of Herringbone's added attractions is the fact that it eliminates the necessity for stocking Lang lay rope for one job and regular lay for another.

Your Roebling Distributor has Herringbone right now. He has, also, copies of a brochure describing Herringbone, the newest Roebling Star Performer. If you wish, write Wire Rope Division, John A. Roebling's Sons Corporation, Trenton 2, New Jersey, for literature and anything you'd like to know about Herringbone.

*Reg. App. For

**ROEBLING**

*Branch Offices in Principal Cities*
*Subsidiary of The Colorado Fuel and Iron Corporation*

**HERRINGBONE**
**WIRE ROPE**

*From General Electric . . .*

# HEAT

Castings automatically transferring from high temperature furnace to other pearlitic annealing equipment at Marion Malleable Iron Works, Marion, Indiana.

**GENERAL ELECTRIC**

# ONE FURNACE SYSTEM DOES SEVEN JOBS

## General Electric "systems" design combines furnace, temperature and atmosphere controls, and materials handling to cut annealing cycle 75%, provide added flexibility, and lower processing costs

When you bring your heat processing problems to General Electric, our engineers will give you what you want and need. Whether it's gas or electric, a small batch furnace or a complex, automated system, you need go no further.

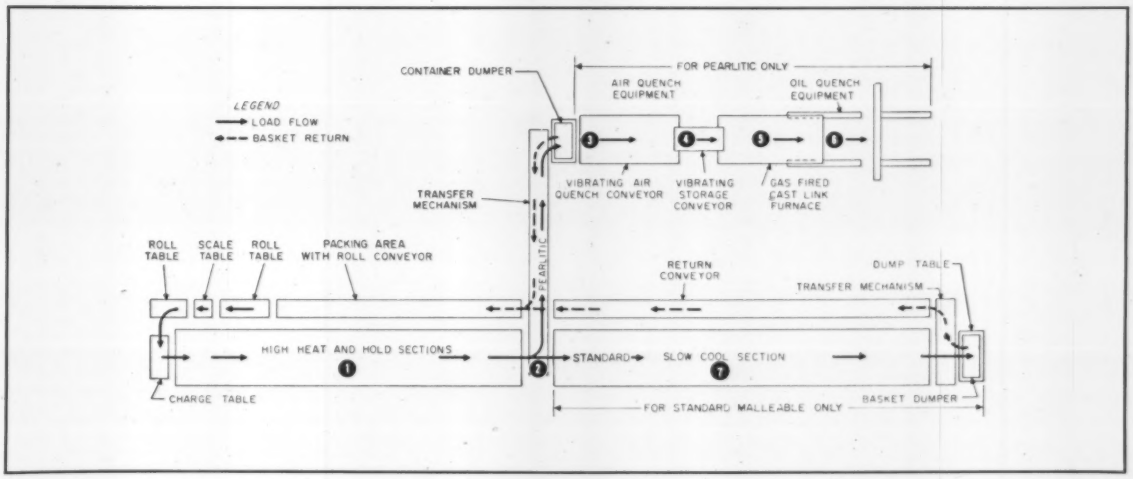
For example, when the **Marion Malleable Iron Works of Marion, Indiana,** set out to acquire "the most modern heat treating equipment which would be very flexible and produce highest quality at a nominal cost," they chose General Electric. The result: a complete system (at left and below) with integrated temperature and atmosphere controls and automatic handling equipment. With one packer and one operator, this system produces 1000 tons of standard malleable iron per month. Or 800 tons of pearlitic and 200 tons of standard malleable per month. Or, with the addition of a separate high temperature furnace, 1000 tons of standard malleable and 800 tons of pearlitic malleable per month. And depending on the type of material required, each of the seven automatic functions (below) can be varied as desired.

In addition, the automatically-controlled annealing cycle has been cut from five days to just 40 hours—a 75% speed-up! Quality is up, and controlled atmosphere (Neutralene) has practically eliminated surface decarburization and assures maximum alloy life of furnace components. Fuel costs are less because of shorter cycles, and labor costs are down. Flexible enough to produce either ferritic or pearlitic malleable, the furnace can even be left loaded and unattended over weekends to allow five-day operation.

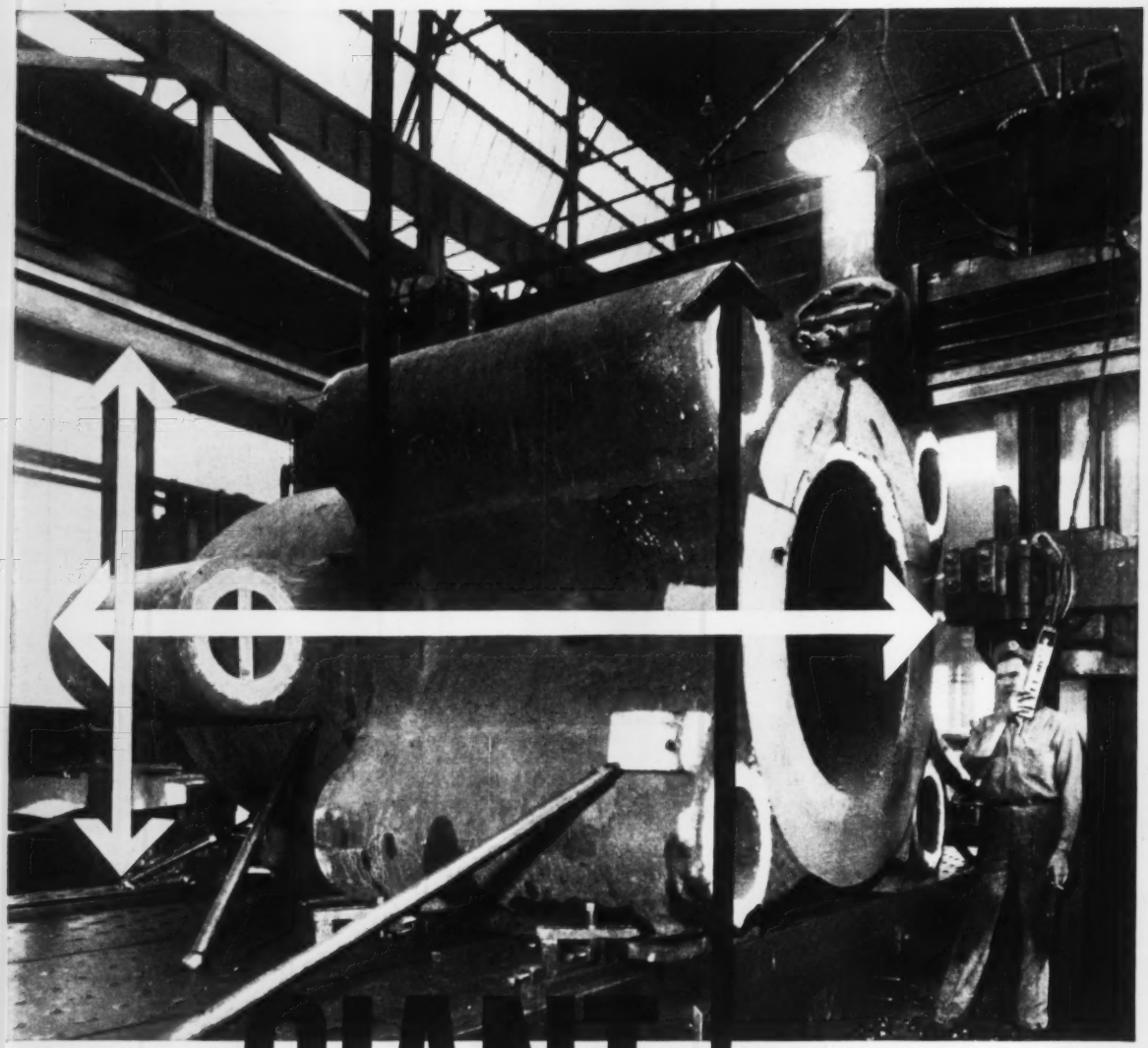
As a result, Marion Malleable can offer a higher quality product and rapid delivery to its customers, and thanks to the savings of the G-E system, at a very nominal cost.

If you're planning a new heat processing installation or modernization—gas or electric, large or small, with or without atmosphere and materials handling equipment—it will pay you to contact your General Electric Apparatus Sales Office. General Electric Co., Section 721-26, Schenectady 5, N. Y.

# GENERAL ELECTRIC




**ONE SYSTEM, SEVEN JOBS.** This complete heat processing system, designed and built by General Electric, automatically (1) heats and holds at temperature, (2) transfers and dumps, (3) air quenches, (4) reloads, (5) reheats, (6) oil quenches, or (7) slow-cools 1000 tons of castings per month with maximum flexibility. Note that two heat processes—pearlitic and standard malleable—can take place simultaneously, depending on mixture of material being processed, and yet work baskets are handled automatically from the time they are placed on the entrance table until the entire cycle is completed.



# GIANT

## IN THE MAKING

Machining a giant press cylinder ... The machining of this huge casting or the building of a complete machine, large or small, is the type of machine work regularly performed in SUN SHIP machinery plant where marine and industrial machinery is built.

We solicit jobbing machine work. Inquiries to our Sales Engineering Department will receive prompt attention.

**Sun**

**SHIPBUILDING & DRY DOCK COMPANY**

ON THE DELAWARE • SINCE 1916 • CHESTER, PA.

# Now...at no increase in price

# 40% more HP...longer service life

# with Gates Vulco Ropes

Gates brings you, through *Specialized* Research in V-Belts, another important cost-saving advance:

Now—at no increase in price—the horsepower rating of Gates Vulco Ropes has been increased 40%.

**As replacements on standard drives, these V-Belts with 40% more load carrying ability will give longer service. Longer life reduces down-time, and cuts belt replacement costs.**

And as the tag tells you: Belts labeled "Gates Vulco Rope" or "Gates Hi-Power" are identical in construction and can be used interchangeably in matched sets.

## Available Now from your nearby Gates Distributor

Today, all Vulco Ropes in Gates distributor and warehouse stocks have the new higher horsepower rating.

See the Yellow Pages of your phone book for your nearest Gates V-Belt distributor.

## Designing NEW Drives?

For new drives, Gates now offers you the *new Super HC V-Belts and Sheaves* — the most advanced concept in power transmission in 25 years. The Super HC Drive is far more compact... takes up to 50% less space. Costs less, too. You save as much as 20% over present V-Belt drives. Ask your nearby Gates distributor for Handbook DH-900 entitled, "The Modern Way to Design V-Belt Drives."

**The Gates Rubber Company** Denver, Colorado
**Gates Rubber of Canada Ltd.,** Brantford, Ontario

TPA-412

# Gates VULCO ROPE Hi-Power V-Belts

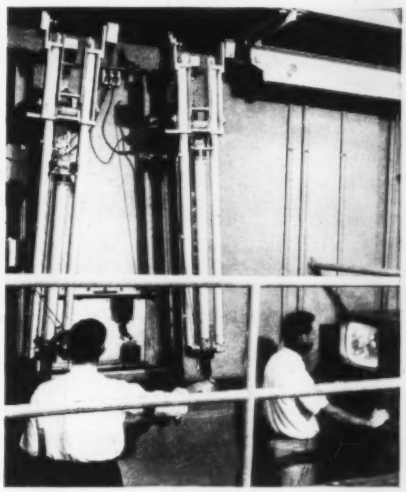
# *How NS solved another special steel problem*

Photos courtesy of Nuclear Systems Division, The Budd Company

**RADIOACTIVE MATERIAL** is handled remotely by operator from behind three-foot thick lead-glass wall. Nilcor strips, which make quick, accurate system response possible, can be seen running vertically from pulleys just above operator's hands.

# SPECIAL NS-ATHENIA STEEL PUTS LIFE IN ATOMIC-AGE ROBOT

**HAND MOVEMENTS** at operator end of master-slave system are translated without distortion, or time lag through seven Nilcor strips (shown in photo) that travel through 15-foot belt and pulley system.



**OPERATOR STATION,** shielded by protective wall, has television monitor screen where action inside radioactive room is reproduced as operator manipulates controls of master-slave system.

To manipulate radioactive materials with lifelike dexterity, from the other side of a three-foot thick protective wall, requires robot controls with a high degree of precision and quick response.

Ordinary cable or belt arrangements gave too much stretch between the operator's "master" hand movements and the identical "slave" movement at the other end of the system. Movements had to be translated almost instantaneously and duplicated exactly at the slave end of the system. To help solve this problem, robot system manufacturers came to the Athenia Steel Division of National-Standard to find a strip material that would serve in the belt-and-pulley arrangement of the mechanism with minimum stretch and friction and without backlashing or overshooting.

NATIONAL-STANDARD ENGINEERS at Athenia in Clifton, N. J., recommended Nilcor* strip (basically a cobalt-chromium-nickel alloy) because of its high fatigue resistance, high tensile strength and exceptionally high corrosion resistance—plus less than ⅛-inch lateral sweep per 8-foot length when laying flat without tension. Experiments with .005 Nilcor strip in the robot systems showed an 80% reduction in stretch and 90% reduction in friction over standard wire materials.

EXPERIENCED ENGINEERING HELP of this kind, for jobs requiring specialty steel and wire to meet unique applications, is available to *you* from National-Standard. For the many thousands of applications where only specialty steel or wire will solve the problem, let National-Standard engineers go to work for you. Write for additional information to National-Standard Company, Niles, Michigan.

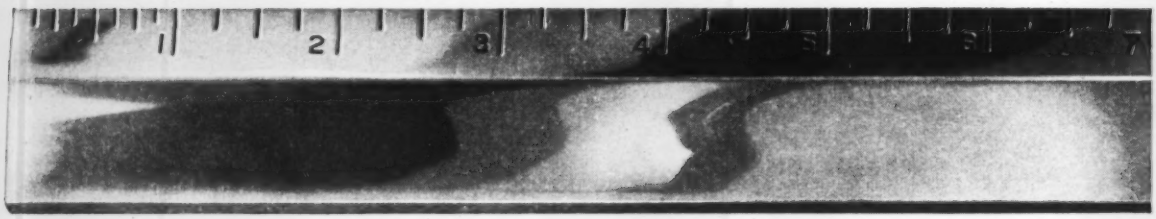
*Trade Mark

Manufacturer of Specialty Wire and Metal Products

**NATIONAL STANDARD**

**DIVISIONS: NATIONAL-STANDARD,** Niles, Mich.; tire wire, stainless, music spring and plated wires • **WORCESTER WIRE WORKS** Worcester, Mass.; high and low carbon specialty wires • **WAGNER LITHO MACHINERY,** Secaucus, N. J.; metal decorating equipment • **ATHENIA STEEL,** Clifton, N. J.; flat, high-carbon spring steels • **REYNOLDS WIRE,** Dixon, Ill.; industrial wire cloth • **CROSS PERFORATED METALS,** Carbondale, Pa.; decorative, commercial, and industrial perforated metals.

# There's just One Rule at Bristol Brass...

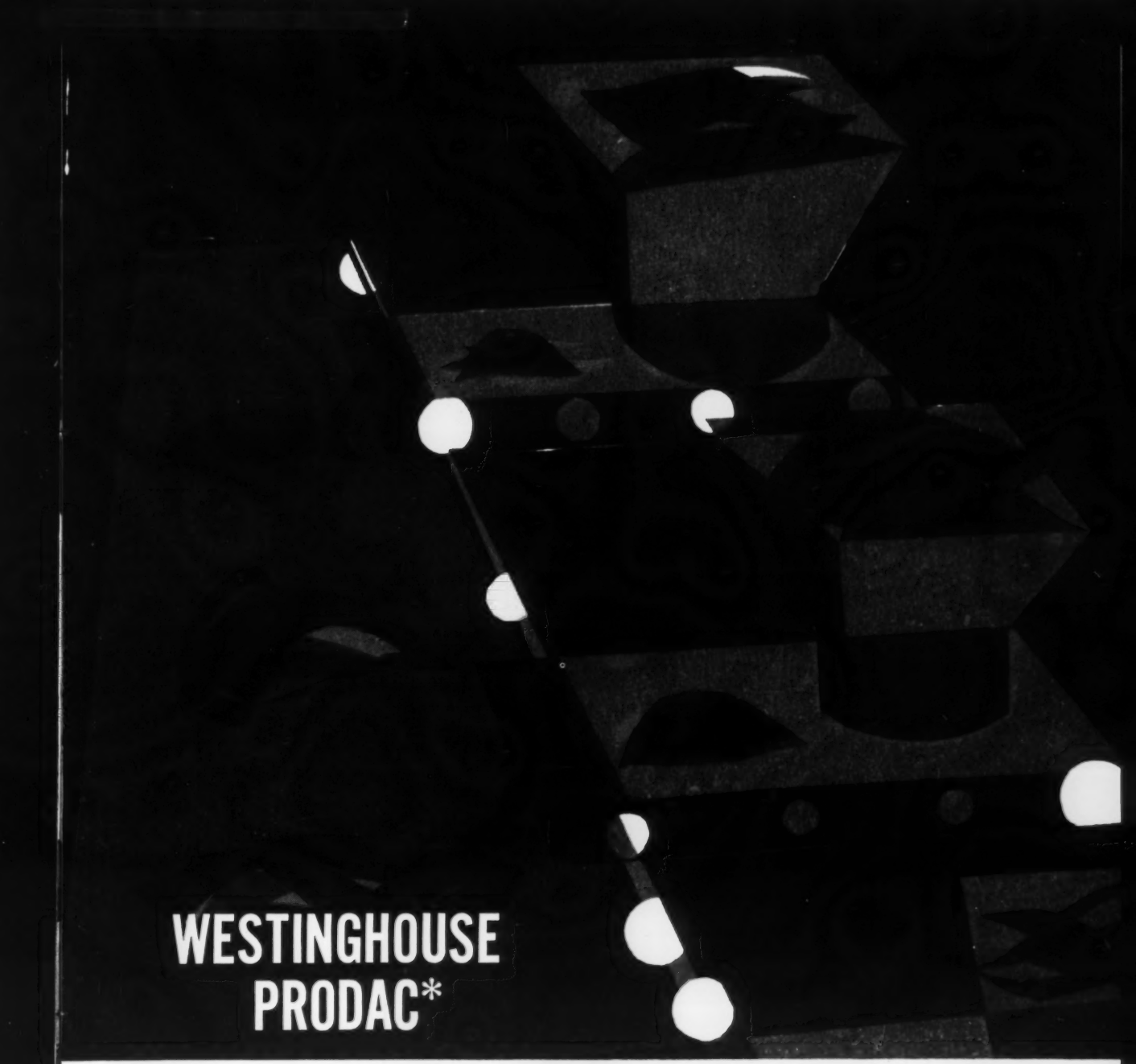


*To make every pound of strip, rod and wire the way we would want it, if we were buying it*

**Bristol-Fashion**
*means Brass at its best*

THE BRISTOL BRASS CORPORATION • SINCE 1850, MAKERS OF BRASS STRIP, ROD AND WIRE IN BRISTOL, CONNECTICUT

*Bristol Brass has offices and warehouses in Boston, Buffalo, Chicago, Cleveland, Dayton, Detroit, Milwaukee, New York, Philadelphia, Pittsburgh, Rochester, Syracuse.*



# WESTINGHOUSE PRODAC*

## means automatic stocking for blast furnace charging

. . . loads and weighs stock house raw material into the skip hoist . . . delivers predetermined ingredients to furnace at the correct time and in proper sequence . . . maintains permanent record of all furnace loadings and exact time accomplished . . . then indicates when a bin needs refilling or clearing. This is but one of the many ways Westinghouse PRODAC† is helping bring about the "mill of the future" today through completely automatic stocking control for blast furnace charging.

Westinghouse has proven PRODAC installations that economically automate slabbing mills, blooming mills, reversing roughers, data accumulation systems and many other mill applications.

By specifying Westinghouse PRODAC for your mill, you open the door to many cost-saving benefits which are unobtainable with conventional controls. For example, PRODAC assures the most consistent standards of quality control at the highest rates of production speed . . . coordinates operation of all machines at the over-all maximum efficiency . . . holds maintenance to a minimum and practically eliminates control failures . . . gives you a "building block" design which provides flexibility required for further mill automation.

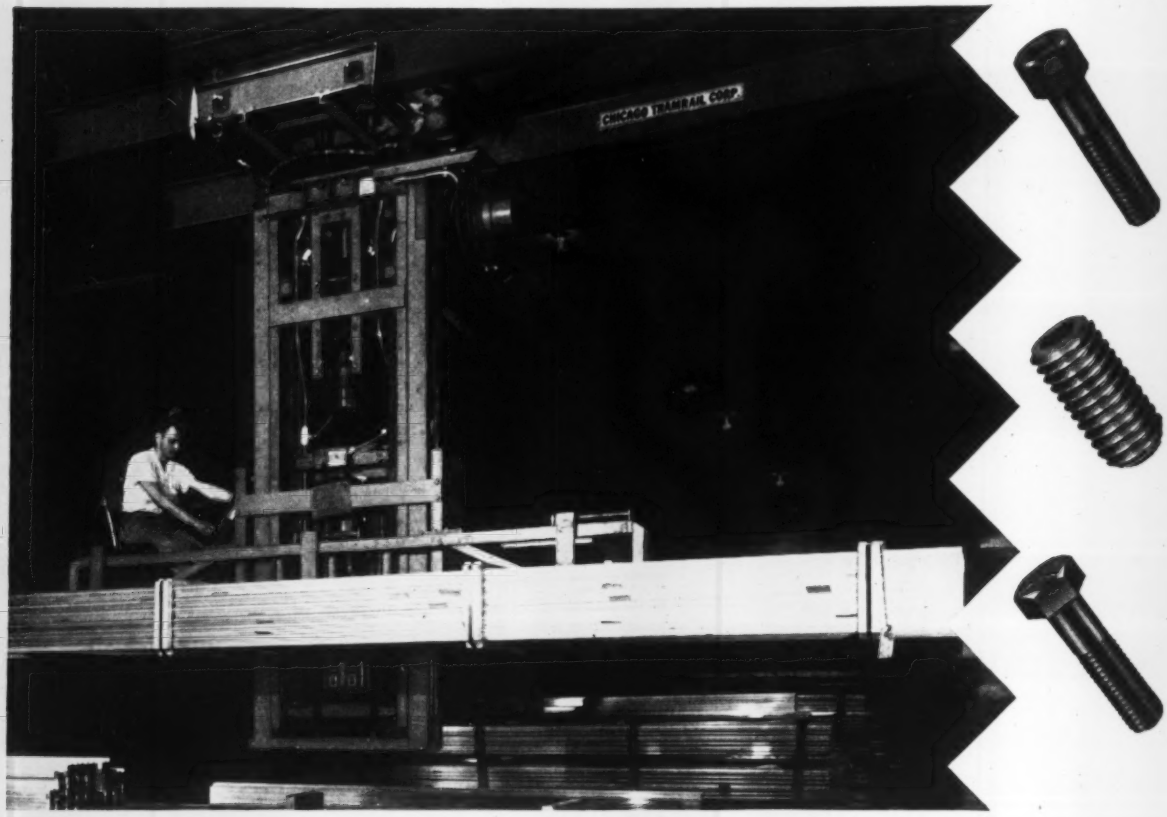
The entire team of Westinghouse PRODAC engineers is at your service to help you determine exactly where and how PRODAC can benefit you. Your Westinghouse sales engineer can give you complete information, or write to Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pa. J-22125

*PROGRAMMED DIGITAL AUTOMATIC CONTROL
†Trade-Mark

YOU CAN BE SURE...IF IT'S Westinghouse

WATCH "WESTINGHOUSE LUCILLE BALL-DESI ARNAZ SHOWS" CBS TV MONDAYS

IT PAYS TO STANDARDIZE ON **STANSCREW**




# 17 different Stanscrew fasteners used in Chicago Tramrail's Trak-Rak

"In constructing our complete line of cranes we make no compromise with the most rigid requirements of safety," says S. W. Fountain, Vice-President, Chicago Tramrail Corporation. "Therefore, reliability is our principle reason for standardizing on quality components such as Stanscrew fasteners."

"But Stanscrew gives us more than fast service and reliable products. Their broad line of over 5,000 fasteners offers a wide selection . . . and their fastener specialists and engineers are always ready to assist our design department in determining the strongest, safest, most economical fastener for every application. For example, in our Trak-Rak stacking crane above, 17 different Stanscrew fasteners are used . . . each selected after careful study for the precise job it has to fill."

Like Chicago Tramrail, many other industrial leaders have learned it pays to capitalize on Stanscrew's backlog of over 80 years of fastener experience. To use this accumulated knowledge in solving your particular fastener problem, just call your Stanscrew distributor. He will quickly arrange for a visit from your Stanscrew fastener specialist.

**STANSCREW** FASTENERS

**CHICAGO** | THE CHICAGO SCREW COMPANY, BELLWOOD, ILLINOIS
**HMS** | HARTFORD MACHINE SCREW COMPANY, HARTFORD, CONNECTICUT
**WESTERN** | THE WESTERN AUTOMATIC MACHINE SCREW COMPANY, ELYRIA, OHIO

**STANDARD SCREW COMPANY** 2701 Washington Boulevard, Bellwood, Illinois

**World's biggest dump truck—made with USS "T-1" Steel**—hauls 165-ton loads at 35 mph. Western Contracting Corp. conceived the truck, had it designed by Charles W. Jones, engineering firm of Los Angeles. Fabricators of box and frame: Eaton Metal Products Corp., Omaha.

# World's biggest truck made 25% lighter with USS "T-1" Steel

Your first impulse is to dive for the ditch when you see this mastodon of trucks roaring down the haul road at Oahe Dam near Pierre, South Dakota. But if you're an equipment builder, you will wonder how they got the tremendous strength necessary without adding too much dead weight.

That was the problem faced by the Western Contracting Corporation of Sioux City, Iowa when they decided to build the biggest possible dump truck. It is an 18-wheel, 750-hp semi-trailer that is currently hauling a payload of 110 yards or 165 tons. The truck is 55 feet long, 16 feet wide and 14 feet high.

**25% lighter.** To get this high capacity with the least weight, they built the box and frame of USS "T-1" Constructional Alloy Steel. "T-1" Steel had a minimum yield strength of 90,000 psi but is now available at 100,000 psi. Western estimated it saved 12½ tons in dead weight or 25% of the trailer's weight.

**Good fabricating properties.** Because USS "T-1" Steel can be readily formed and welded, all members could be built up from plates. Reinforcing for the box was formed into channels through which exhaust gases are piped to keep the load from freezing in cold weather.

**High resistance to impact abrasion.** Dumping a 165-ton load in a few seconds causes terrific abrasion. "T-1" Steel is noted for its ability to take this kind of punishment, and it gives much longer service than ordinary steel.

In addition to 100,000 psi "T-1" Steel, we produce three brands of USS High Strength Steel in the 50,000 psi Yield Point range—MAN-TEN, COR-TEN and TRI-TEN. Each has its own characteristics that make it ideal for certain applications in construction and mining equipment. Find out how these steels can reduce weight, increase strength, and lower your operating costs. Address United States Steel, Room 2801, 525 William Penn Place, Pittsburgh 30, Pennsylvania.

*USS, "T-1," COR-TEN, MAN-TEN, and TRI-TEN are registered trademarks*

United States Steel Corporation – Pittsburgh
Columbia-Geneva Steel – San Francisco
Tennessee Coal & Iron – Fairfield, Alabama
United States Steel Supply – Steel Service Centers
United States Steel Export Company

**United States Steel**

USS

# First atomic aircraft carrier uses USS Quality Steel Forgings

The Navy is now building the ENTERPRISE, the world's first nuclear-powered aircraft carrier. You won't hear much about it because of security, but if you had visited U. S. Steel's Homestead plant a few weeks ago, you could have inspected two of the parts of the ENTERPRISE'S power system. You see them in the picture—a closure head flange and a top disc for one of her eight reactor vessels. They are USS Quality Forgings.

The top disc will be seated inside the flange and both parts will be welded to other sections to form a single, sealed reactor vessel. The top disc weighs 36,750 pounds and the flange weighs 74,000 pounds. In service, these parts must withstand high pressure and radioactivity. The steel must be of excellent quality.

Manufacture of these Ni-Cr-Mo alloy steel parts included forging, preliminary heat treating and preliminary machining. This was followed by quenching and tempering. Then came a battery of tests: ultrasonic inspection, tangential tensile tests, Charpy V notch impact tests, grain size tests, bend tests and magnetic particle inspection.

These are just two examples of the many forged flanges, discs, rings, heads, cylinders, and bored pipe that United States Steel has produced during the past few years for industrial and marine nuclear applications.

These two forgings have an especially critical job to perform, so they were made by top-skilled men using the finest equipment—the same men and equipment that make *every* USS Quality Forging. We will appreciate your inquiries or requests for our free 6-page booklet on USS Nuclear Forgings. Write to United States Steel, 525 William Penn Place, Pittsburgh 30, Pa. *USS is a registered trademark*

United States Steel Corporation—Pittsburgh
Columbia-Geneva Steel—San Francisco
Tennessee Coal & Iron—Fairfield, Alabama
United States Steel Export Company

**United States Steel**

USS

**Here is one** of a fleet of forty Type 430 Stainless Steel tank cars that transport nitric acid. Built in 1956 by General American Transportation Corporation, these tank cars are still in excellent condition.

# Leading the pure life—in USS Stainless Steel

A manufacturer's *second* biggest disappointment is to have his product rejected because it was contaminated during shipment. The *biggest* disappointment comes when the customer buys his next order from someone else.

Manufacturers who ship or contain their products in Stainless Steel seldom worry about product purity. Many chemicals that eat away other metals have no effect on Stainless Steel. It keeps a smooth, dense surface that is easy to clean. No corrosion. No pits. No place for dirt to hide. And there's less danger of spoiling one batch with residue from another.

Because Stainless Steel is so strong, it can be used in thinner, lighter gages—reducing the overall weight of the container. But the real clincher is this: even though Stainless Steel costs more, there is no cheaper material in the long run. Specify USS Stainless Steel . . . through our nearest sales office or your local Steel Service Center.

*USS is a registered trademark*

United States Steel Corporation – Pittsburgh
American Steel & Wire – Cleveland
National Tube – Pittsburgh
Columbia-Geneva Steel – San Francisco
Tennessee Coal & Iron – Fairfield, Alabama
United States Steel Supply – Steel Service Centers
United States Steel Export Company

USS United States Steel

PRECISION Quarterly NUMBER 1

PRECISION WELDER AND FLEXOPRESS CORPORATION, 3520 Ibsen, Cincinnati 9, Ohio

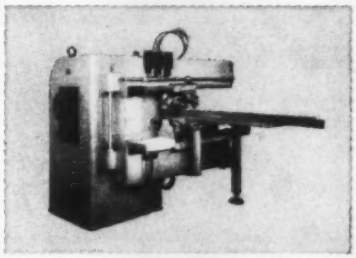
# GOLDMINE IN SCRAP

## Butt-seam welding process saves $70,000 in one year on one automotive stamping

EVERY TIME the automotive industry uses a ton of sheet steel, 35 per cent of it becomes scrap. What a saving if some of it could be easily joined into bigger pieces from which parts could be blanked or drawn, just like from virgin metal!

If you've been following the industrial news, you know this is no pipe dream. A machine to make useful pieces out of scrap has been perfected and is about to be installed in one of the country's largest automobile plants. That company predicts a saving of $70,000 a year on one automobile stamping alone:

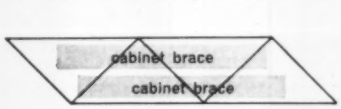
**The machine** is the Precision Butt-Seam Welder, a standard machine that



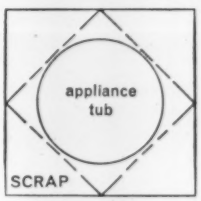
is easily adaptable to a great variety of scrap reduction programs. It butt welds sheet steel—mild, low alloy, high carbon or stainless—by the Peco butt-seam welding process.

The Precision Butt-Seam Welder can join pieces of metal edge to edge as fast as 24 feet per minute. The butt weld is made between foil strips of parent metal which increase resistance and contain the weld, so that it turns out scarcely thicker than the original sheet (approximately 10 per cent). You can deep draw a welded piece without cleanup, or dress the weld with a light grind for a smooth one-piece look.

Companies which generate a lot of flat scrap—automobile plants, appliance makers, large stamping shops—will find this unique welder especially useful. The sketch above gives just a hint of how an appliance maker might use metal he formerly had to scrap. You can find a dozen similar examples around almost any stamping shop, all of them representing dollars going to waste.

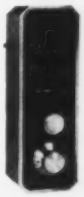



RECLAIMED STOCK PATTERN



**Suppose** you wanted to stamp out a part that looked like Oklahoma. No matter how you arranged it on the strip, you'd have lots of scrap. But suppose you blanked out the bulk of the state from one strip and the panhandle from another, and then butt-seam welded the two parts together. You'd cut your scrap in half—maybe more, your welded parts would be absolutely as good as those made of one piece, and your original metal costs would be far less!

*For companies who want to stamp Oklahomas (or anything else) and save, we will be glad to supply any number of Precision Butt-Seam Welders. Also advice, know-how, service, and Precision Flexopresses to do the stamping.*



# Stock Jams Ended

A SIMPLE DEVICE, no bigger than a couple of decks of playing cards, is protecting presses these days from the dangers of overload. If an extra thickness of stock enters the die, this device stops the press.

So do lots of other safety stops, but this one is different. It isn't affected by current variations, or vibration, because it doesn't operate by those principles.

Called the Precision Flexostop, this device is mounted on the press next to the flywheel. Extra deflection of the flywheel, caused by overload, will trip the Flexostop, which can be adjusted to detect any variation in stock thickness greater than 0.010 in.

By an odd coincidence Precision Welder and Flexopress* salesmen just happen to carry a Flexostop or two in their briefcases. You might ask to see one. It can be installed on most any press with an air clutch in a matter of minutes.

**Flexopress—Its patented ball-bearing ram makes all others obsolete.*

## Possibly you missed . . .

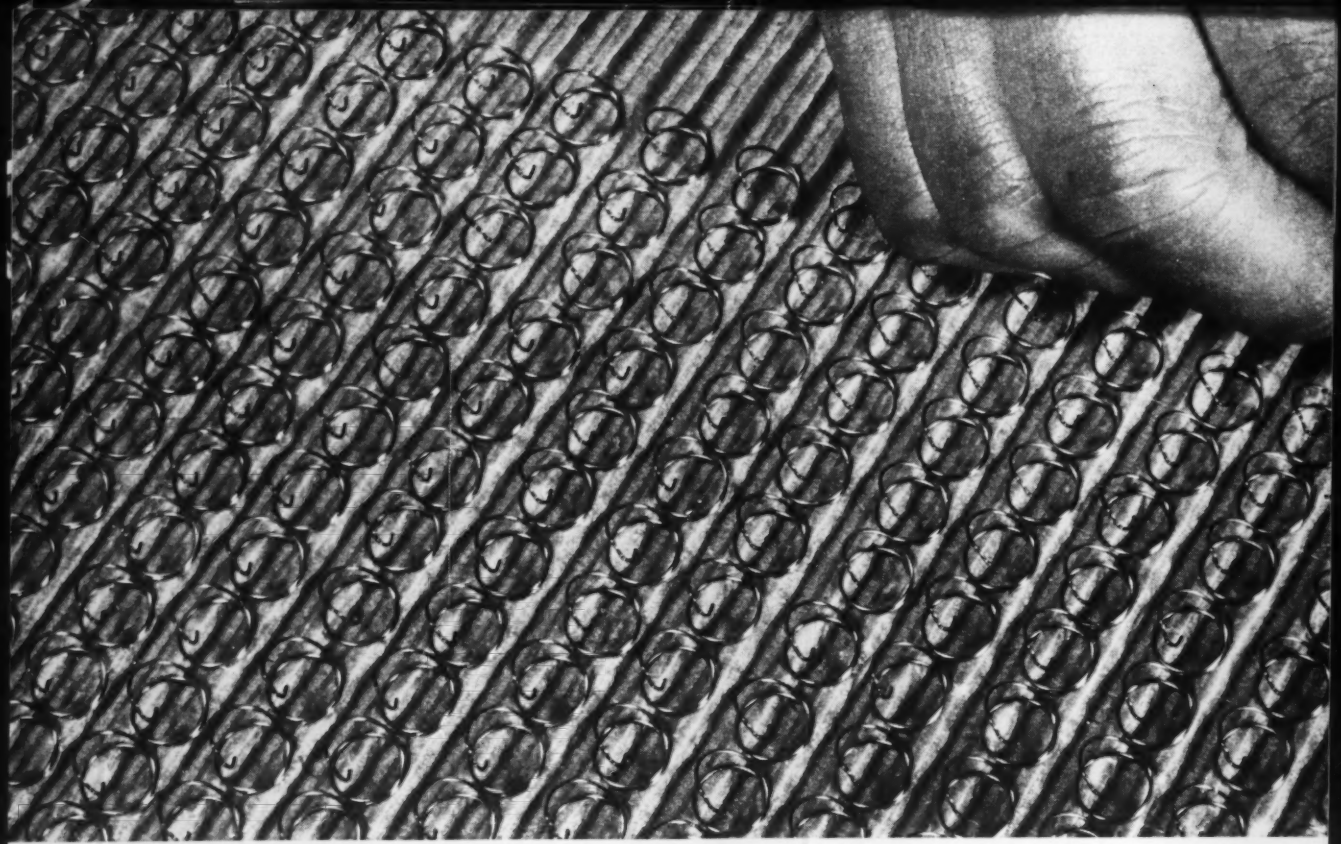
*These objective articles about other Precision developments:*

- ☐ Stock Fed Into Lamination Press at 2500 Inches a Minute, *Machinery*, February, 1958
- ☐ Magnetic-Force Method Welds Vinyl-Laminate Steel Sheet, *Product Engineering*, June 30, 1958

*or want more information about these:*

- ☐ Peco Butt-Seam Welding Process
- ☐ Precision Flexostop
- ☐ Precision Spot & Projection welders
- ☐ Precision Flexopresses with the Patented Ball-Bearing Ram

*Check off what you want and let us know. We'll oblige.*



**Wispy but precise** as the pattern they make on this gummed pallet are carburetor pump springs coiled from Johnson Steel's .014 tin-coated music wire.

## Johnson Steel's Wire Is In Springs That Are . . .

# 'Out Of This World'

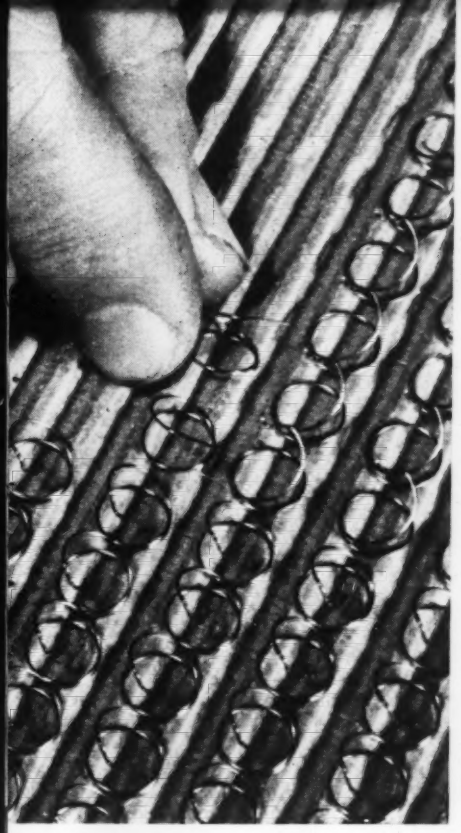
**Mid-West Spring relies on Johnson Steel's Music Wire to make precise springs for satellites to sewing machines.**

Trouble is their business . . . customers' trouble, that is—even in Outer Space.

That's the approach of Mid-West Spring Manufacturing Co. of Chicago, a firm that goes after the tough jobs with the help of Johnson Steel & Wire Co., its major supplier.

"We want the job the others can't do, whether it's a spring for a space missile or for a thermostat in your home," says R. H. Muehlhausen, vice president of sales.

**Full range** of Johnson Steel's specialty wires stocked at this warehouse guarantees same-day delivery to wire users in Chicago area.



Tooling, production skill, close control of quality and reliance on Johnson Steel's music wire for 31 years enable Mid-West to take difficult jobs in stride.

**"Johnson Steel is the only manufacturer who can provide us with a full range of music wire, plus oil tempered and variously coated as well as bright, hard drawn spring wires we require," says James J. Dunne, purchasing agent and assistant sales manager. "The large stock in their Chicago warehouse is a distinct advantage, especially when we are pressed for fast delivery."**

Mid-West is a leading producer of precision-engineered springs—some of them literally "out of this world," performing functions in missiles and satellites now in orbit. Other products of the firm's three plants are used in farm implements, business machines, furnace controls, autos, home appliances and various electronic devices.

**Mid-West uses the full range of Johnson Steel's music wire, from .003 to .300 inch, in all finishes. Every coil is checked first with a pilot spring, next at set-up on the coiler and finally at random in production. Some special springs get 100 percent electronic testing.**

Roland Parduhn, Mid-West's methods engineer, says:

"We watch tensile strength, surface condition and size very closely. Any deviation or defect, and too many springs would vary from their designed load. We depend on Johnson Steel to maintain consistent quality."

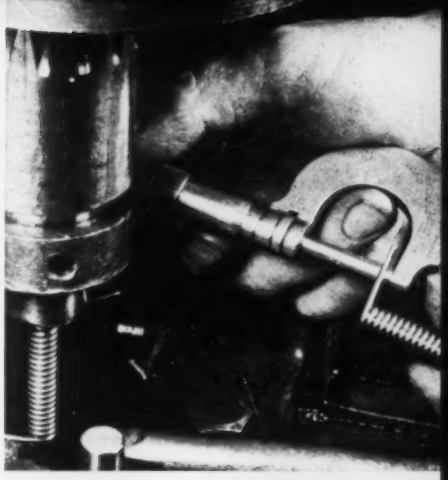
This applies especially to one of the company's biggest production run items—a tension spring for the Anderson Co. of Gary, Ind., supplier of ANCO windshield wiper blades and arms to the automobile, truck, bus and aircraft industries.

• **Coils for Precise Control**—The spring precisely controls the pressure of the wiper on the glass. Too much pressure and the wiper will stall; too little and it will flutter in the wind.

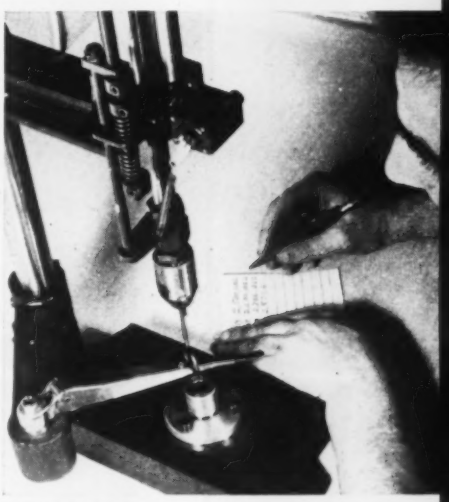
Mid-West's production of this spring—numbering in the millions—represents a rugged performance test, but Johnson Steel's music wire is its match.

The help that Johnson Steel gives Mid-West Spring in its production processes can be duplicated for your advantage. Whether your need is music wire, or any of the many other products in Johnson's complete line of specialty wires, the benefits start the moment your order is received.

A national sales staff is ready to help you quickly and profitably with any application. Contact the district office nearest you.



**Unvarying size,** tensile and surface of Johnson Steel's .084 music wire meets Mid-West Spring's demands for coiling this windshield wiper spring.



**Fatigue test** measures endurance of wiper spring. Here spring records its 2,800,000th stroke with no sign of load loss.

**Coilability counts** in making this thermostat control spring, which is tested and sorted electronically on coiler. Adjustable-screw plug is threaded in spring, made of Johnson's .058 music wire.

# Johnson Steel & Wire Company, Inc.

Worcester 1, Massachusetts

*a subsidiary of* **Pittsburgh Steel Company**

Grant Building • Pittsburgh 30, Pa.

**DISTRICT SALES OFFICES**

| | | | | |
|---|---|---|---|---|
| Atlanta | Cleveland | Detroit | Los Angeles | Pittsburgh |
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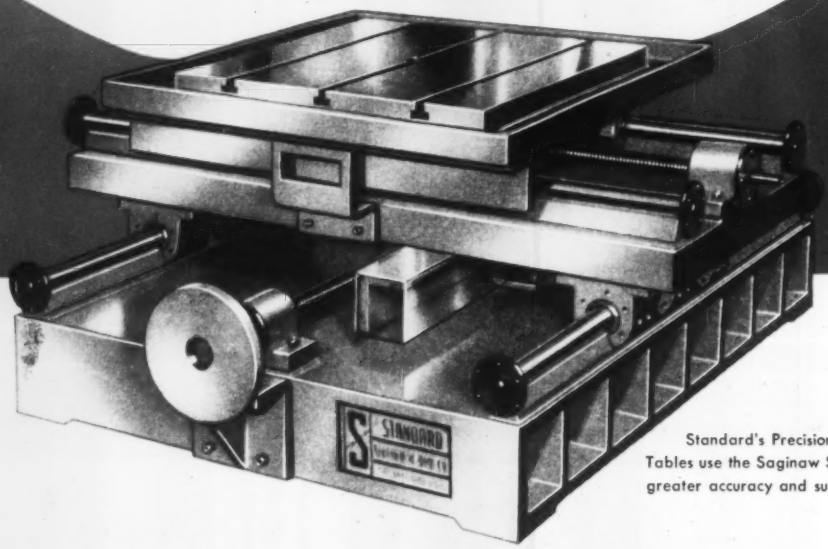
# WHEN MICRO-INCH POSITIONING WILL MAKE OR BREAK YOUR PRODUCT...

you need the

# SAGINAW b/b SCREW




Standard's Precision Two-Axis Positioning Tables use the Saginaw Screw for less friction, greater accuracy and superior dependability.

"The accuracy of the Saginaw Ball Bearing Screw plays a vital part in the precision measuring system of our Two-Axis Positioning Tables. These tables take 'orders' from an electronic brain to perform critical positioning during production of printed circuits and aircraft and missile components. Because of Saginaw Screw's standardized design, it saved us time and money in our original engineering, too!" *says Mr. W. A. Ferguson, Advertising Manager, Standard Electrical Tool Co., Cincinnati, Ohio.*

The Saginaw b/b Screw converts *rotary* motion into *linear* motion with over 90% *efficiency*. It is saving power, space, weight and assuring smoother, more dependable performance in countless products from miniature electronic controls to giant production equipment.

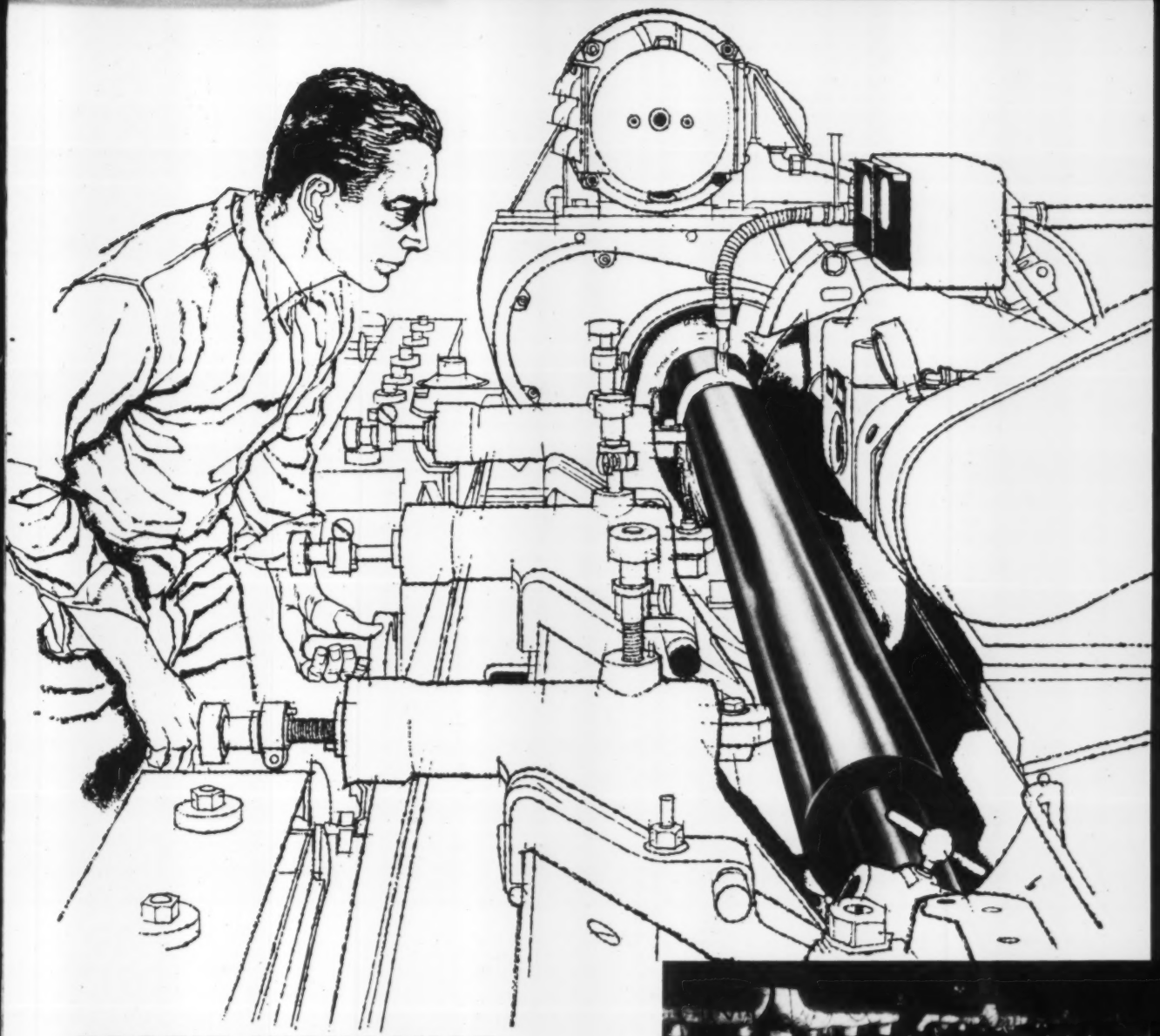
Perhaps the Saginaw Screw can give *your* products that valuable **S**ales **A**ppeal you're looking for right now. For the detailed story, write or telephone the Saginaw Steering Gear Division, General Motors Corporation, Saginaw, Michigan—*world's largest producers of ball/bearing screws and splines.*

*Give your products NEW SALES APPEAL... switch to the*

Saginaw

ball bearing Screw

WORLD'S MOST EFFICIENT ACTUATION DEVICE



# PROFIT INSURANCE with J&L Stainless Steel Bars

Your machining costs on stainless steel bars are part of your investment for profit. Add your costs for tooling, handling and polishing, and you multiply your investment, often many times over.

Scrapping a single bar wipes out that investment—and with it most of your profit on a large volume of finished goods.

Every step taken to reduce rejects helps insure profits! The biggest step you can take in that direction is to specify J&L **Consistent** Quality on all orders for stainless steel.

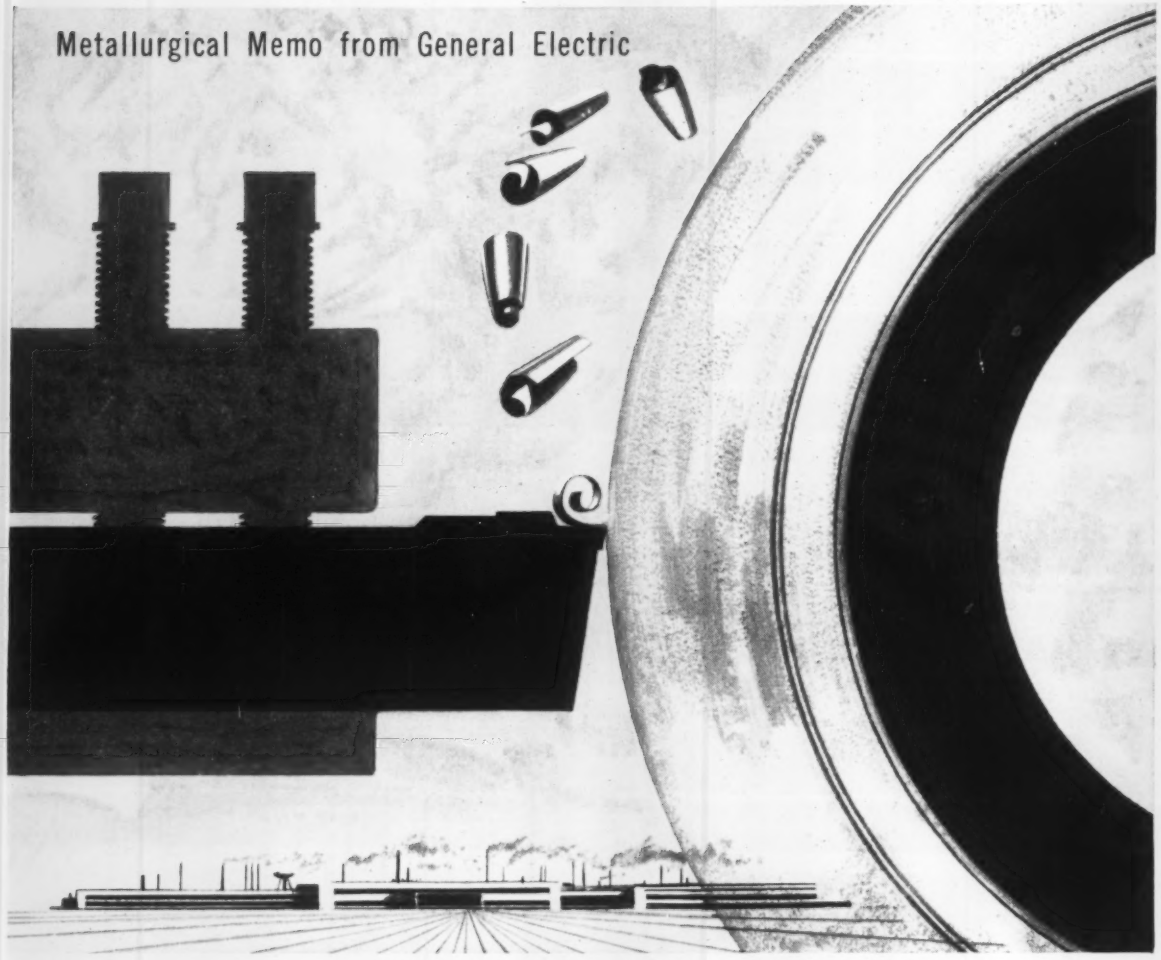
J&L leads the industry in melt shop standards for stainless steel —the point where quality starts, **and your profit insurance begins.**

Careful attention to every production detail is the key to J&L quality

*Plants and Service Centers:*
*Los Angeles • Kenilworth (N. J.) • Youngstown • Louisville (Ohio) • Indianapolis • Detroit*

J&L
**STAINLESS**
**SHEET • STRIP • BAR • WIRE**

**Jones & Laughlin Steel Corporation • STAINLESS and STRIP DIVISION • Box 4606, Detroit 34**




# Why 242 different toolholders?

**Metallurgical Products Department reports on an expanded new line of Lift-O-Matic toolholders . . . 242 sizes to speed changeovers on every job**

Nobody needs to tell you what carbides have done for metalcutting . . . or how Carboloy® disposable inserts have led the way. *But making inserts is only half the job;* the other half is to provide you with toolholders that let you get full value from these miracle metals.

*Carboloy Lift-O-Matic toolholders do this job.* There are now three types—positive rake, negative rake, and tracer. All provide access to the clamp setscrew from either top or bottom—together with a self-raising chip-breaker clamp—for fastest possible indexing. All cut your inventory needs by providing interchangeability of parts. In addition, there is a full line of Carboloy *heavy-duty* toolholders.

This expanded Lift-O-Matic toolholder line is stocked by your *local* Authorized Carboloy Distributor—3 types, 9 styles, 242 sizes—*plus* the widest range of styles, sizes, and grades of *inserts* in the industry. Call him (see the Yellow Pages under "Carbides"); or write: *Metallurgical Products Department of General Electric Company, 11141 E. 8 Mile Ave., Detroit 32, Michigan.*

**CARBOLOY®**
CEMENTED CARBIDES

METALLURGICAL PRODUCTS DEPARTMENT

**GENERAL ELECTRIC**

CARBOLOY® CEMENTED CARBIDES • MAN-MADE DIAMONDS • MAGNETIC MATERIALS • THERMISTORS • THYRITE® • VACUUM-MELTED ALLOYS

# YOU'RE JUST A FINGER-TWIST AWAY FROM ALCOA ALUMINUM FASTENERS

IF YOU can dial a telephone, you have just about all the "inventory control" you'll ever need to keep you stocked up with Alcoa® Aluminum Fasteners. For, thanks to Alcoa's unmatched distribution facilities, there's a *local* distributor near you with full stocks of Alcoa Fasteners in standard sizes and types . . . to be delivered in a jiffy!

And, of course, Alcoa Aluminum Fasteners are a sound choice in *any* case. Bright, flawless finish adds extra appeal to your product at the time of purchase—and won't stain it or mar it any time *after* purchase. Moreover, as everyone knows, you always get *full* count, *full* quality when you specify Alcoa—whether you order a hatful or a carload!

So don't worry if stocks run short. Look up your local distributor in the Yellow Pages of your phone book. Call him. He'll give your order *action* at the local level almost before you can hang up! *P.S.:* For additional facts and samples of Alcoa Aluminum Fasteners, just mail the coupon below.

Your Guide to the Best in Aluminum Value

ALCOA ALUMINUM

For Exciting Drama Watch "Alcoa Theatre" Alternate Mondays, NBC-TV, and "Alcoa Presents," Every Tuesday, ABC-TV

Free . . . Facts, Samples . . . Free

Aluminum Company of America
2005-F Alcoa Building, Pittsburgh 19, Pa.

Gentlemen: Please send complete specification data and samples of Alcoa Aluminum Fasteners.

Name _____

Title _____

Company _____

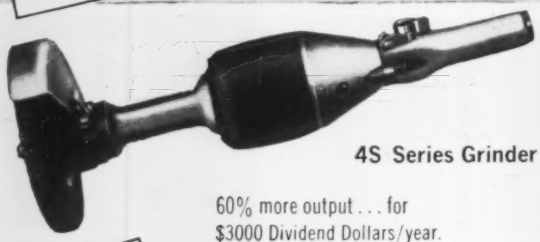
Address _____

# 4 NEW SERIES IR GRINDERS

## to give you an ANNUAL DIVIDEND on your PAYROLL DOLLARS

**NEW** *DESIGNS SPEEDS POWER*

NEW



**4S Series Grinder**

60% more output . . . for $3000 Dividend Dollars/year.

NEW

**001 Series Grinder**

25% more output . . . for $1250 Dividend Dollars/year.

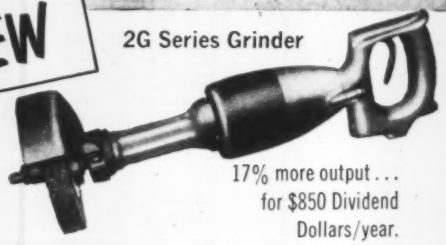
NEW

**42F Series Grinder**

25% more output . . . for $1250 Dividend Dollars/year.

NEW

**2G Series Grinder**



17% more output . . . for $850 Dividend Dollars/year.

If your operators are using older model grinders, you can increase their man-hour productivity by as much as $3000 Payroll Dollars in one year, just by replacing the older tools with one of the new I-R designs.

Multiply these *Annual Dividends* by the number of grinder operators in your plant, and you can see why management today is taking a new look at portable tool operations.

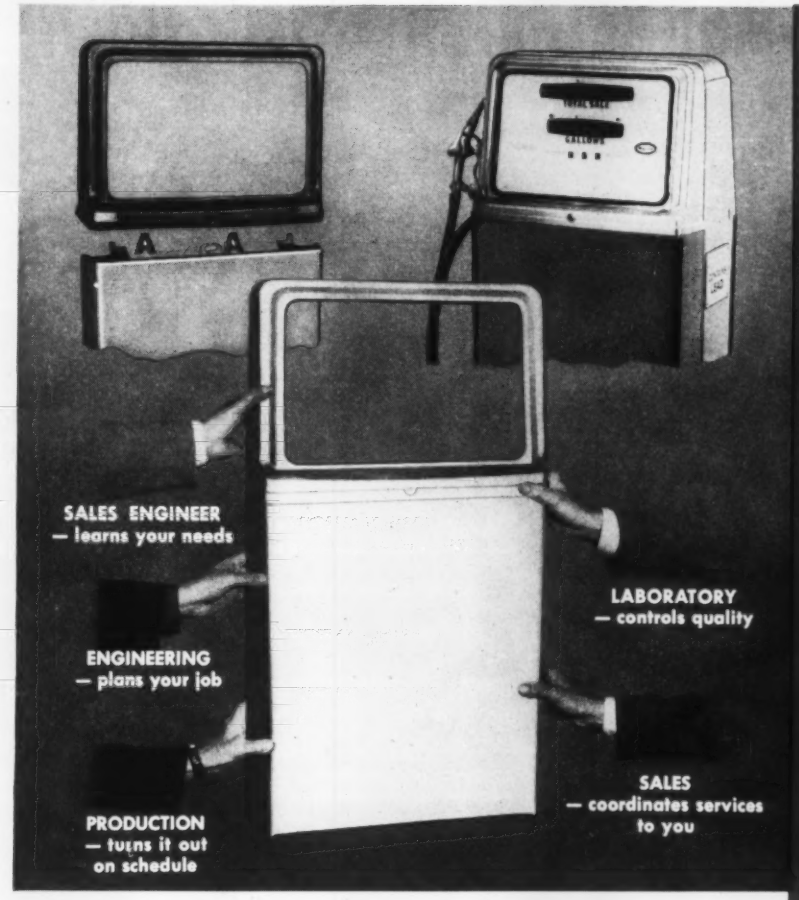
There's a fast, easy way to calculate the amount of *Dividend on Payroll Dollars* these new I-R grinders can help you earn in just one year—without adding to your present payroll.

It's yours without obligation. To get it, call your I-R AIRengineer today. Or write Ingersoll-Rand, 11 Broadway, New York 4, N. Y.

Ingersoll-Rand

*Tools plus AIRengineering increase output per man*

8-923




STAMPED Pump Housing Door, shown at left, is produced by T & W from 18-gauge cold rolled steel, or 0.050-gauge aluminum. It is 25¼" wide, 45½" high, 5¼" deep, assembled. T & W welds on the stamped corner brackets and latch fittings, shown in the background of the illustration (A).

FORGED Diesel Connecting Rod, 16 inches long, produced by T & W Technique to hold to the exacting weight tolerances of 6 ounces, and to give a metallurgical structure of desirable machinability, and still maintain required strength and toughness for the application.

• • •

Write for 20-page book "Transue & Williams Challenges the Future" explaining how T & W Technique produces forgings and stampings that cost you less at your point of assembly.

## MANY HANDS MAKE *BETTER* WORK

Every inquiry, every order you send to T & W receives special attention from *each* of a battery of experts. The ideas, the supervision, the driving force of *each* one contribute, for the best results. Teamwork is an important part of T & W Technique — a way of producing forgings and stampings for you so they usually cost you less at your point of assembly.

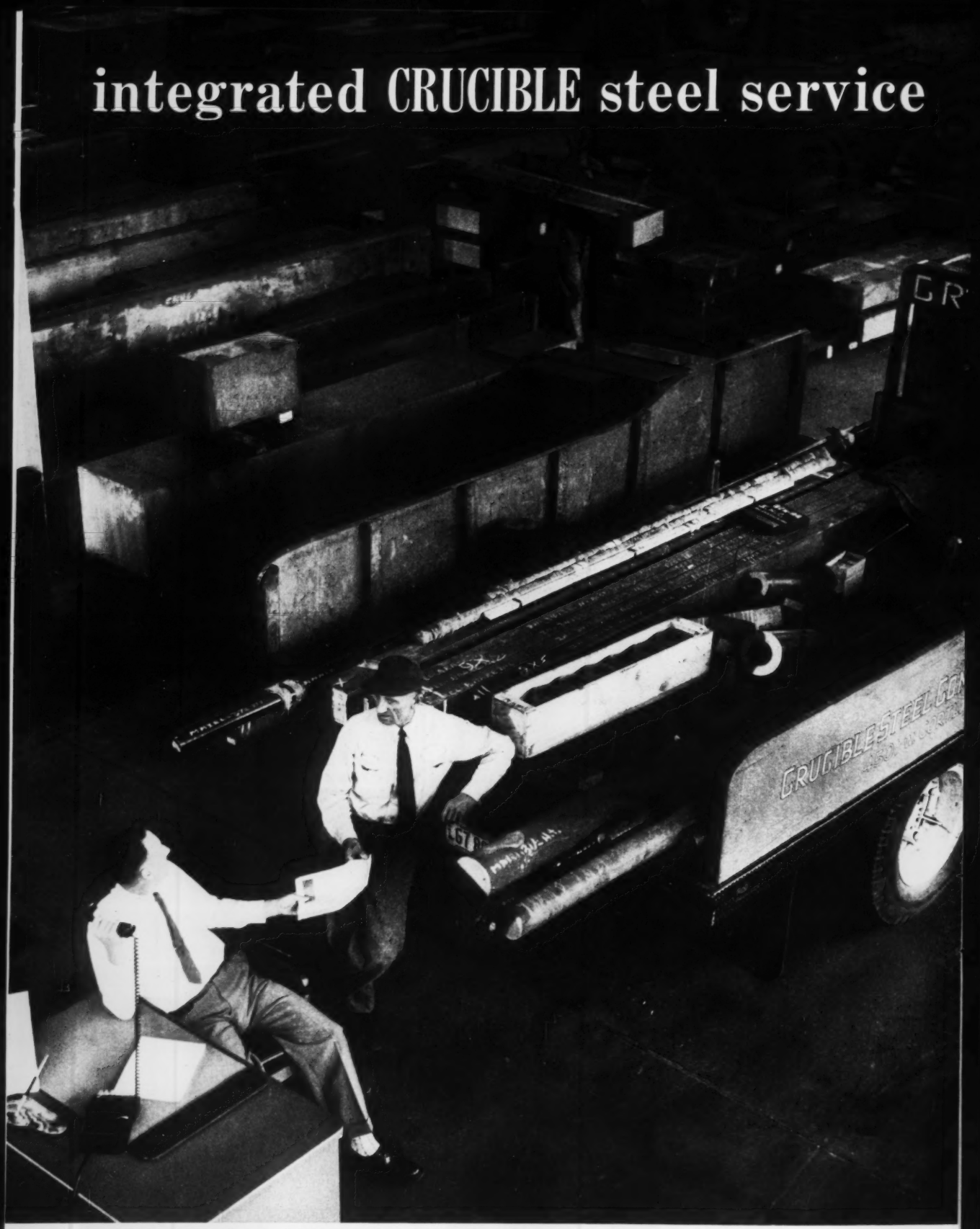
**SALES OFFICES** NEW YORK • PHILADELPHIA • STAMFORD
CHICAGO • INDIANAPOLIS • DETROIT
HOUSTON • LOS ANGELES

**FORGINGS & DEEP DRAWN STAMPINGS**

**TRANSUE & WILLIAMS**
**ALLIANCE, OHIO, U.S.A.**

Name _____ Title _____
Company _____
Street _____
City _____ State _____

# integrated CRUCIBLE steel service




Orders for specialty steels go out fast — usually overnight or even earlier — from *local* Crucible warehouses. That's because each warehouse has a wide variety of grades and sizes on hand, *at all times*.

# gives you local stocks of 16,000 specialty steel items for immediate delivery

Within minutes, the Crucible inside account salesman can tell you if the grades, sizes and quantities you need are available. He'll check his customer's master file for your delivery requirements, billing details, etc. And then he'll quickly arrange for cutting to meet customer's requirements. So deliveries are swift and sure.

This combination of large local stocks and warehouse efficiency means you can fill even the most varied or unusual requisitions for specialty steels with a single phone call.

It's a basic reason why purchasing agents who *depend* on local sources call Crucible *first* – like this one:

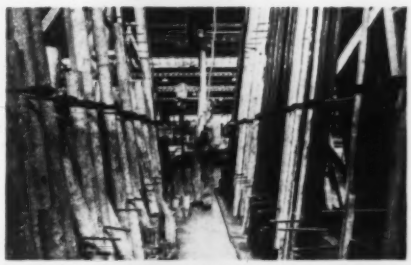
"We're basically a tool and die 'job' shop. We never know what steel we'll be using from one day to the next. So whatever we need, we need fast. It has been our experience that it saves time to call the Crucible warehouse first."

Why not simplify and speed up your specialty steel purchases by relying on your local Crucible warehouse? The advantages of Crucible's entire integrated operation, from mining the ore to steelmaking and warehouse delivery, are all available through the nearby source. *Crucible Steel Company of America, Dept. PF15, The Oliver Building, Mellon Square, Pittsburgh 22, Pa.*

**STOCK LIST**

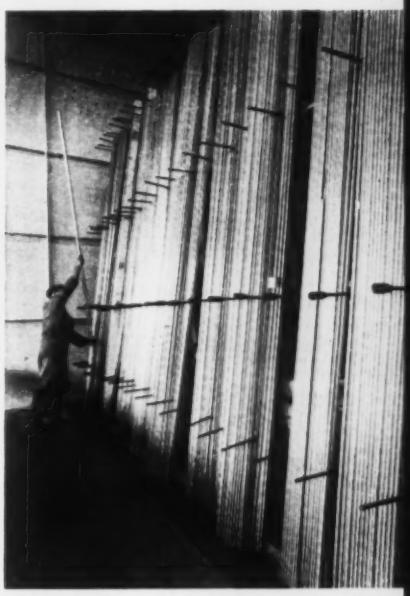
**Keeps you up-to-date on local stocks of specialty steels. Just ask the Crucible salesman to place your name on the regular mailing list.**

**One Source For All These Steels**

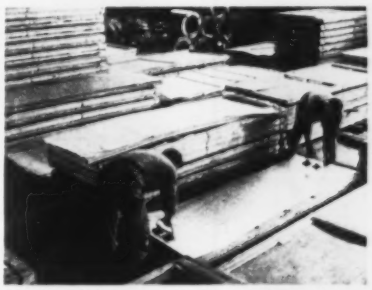


Local warehouse can fill both large and small orders from stocks like these of hollow tool steel sections and solid rounds.

Die casting die steels and plastic mold steels stand ready for cutting to order and immediate delivery.



Most Crucible warehouses stock stainless bars — stack them upright in "A" racks to protect the surfaces.



Need stainless sheet? The local warehouse stocks most types, finishes and sizes for prompt delivery to you.

**TOOL STEELS**—Water, oil, air hardening, shock resisting, hot work, plastic and die casting steels in all forms, including bars, sheets, plates, drill rod, hollow bars, forgings and flat ground stocks

**HIGH SPEED STEELS**—Crucible's famous "Rex"® steels: Rex Thrift Finish rounds, hot rolled and cold drawn flats and squares, drill rod, forgings, sheets, plates, and tool bits

**STAINLESS STEELS** — Bars, sheet, strip, wire, cold heading wire, metalizing wire, plates, angles

**FREE MACHINING STEELS** — Crucible Max-el® rounds, hexagons, plates and brake die steel

**ALLOY STEELS** — Bars, billets, strip and sheet

**COLD ROLLED CARBON SPRING STEELS**

**DRILL STEELS** — Hollow and solid drill steels

**ALUMINUM EXTRUSION DIE STEELS**

**HOLLOW TOOL STEEL**

**WELDING AND HARD FACING ROD**

**PLASTIC MOLD STEELS**

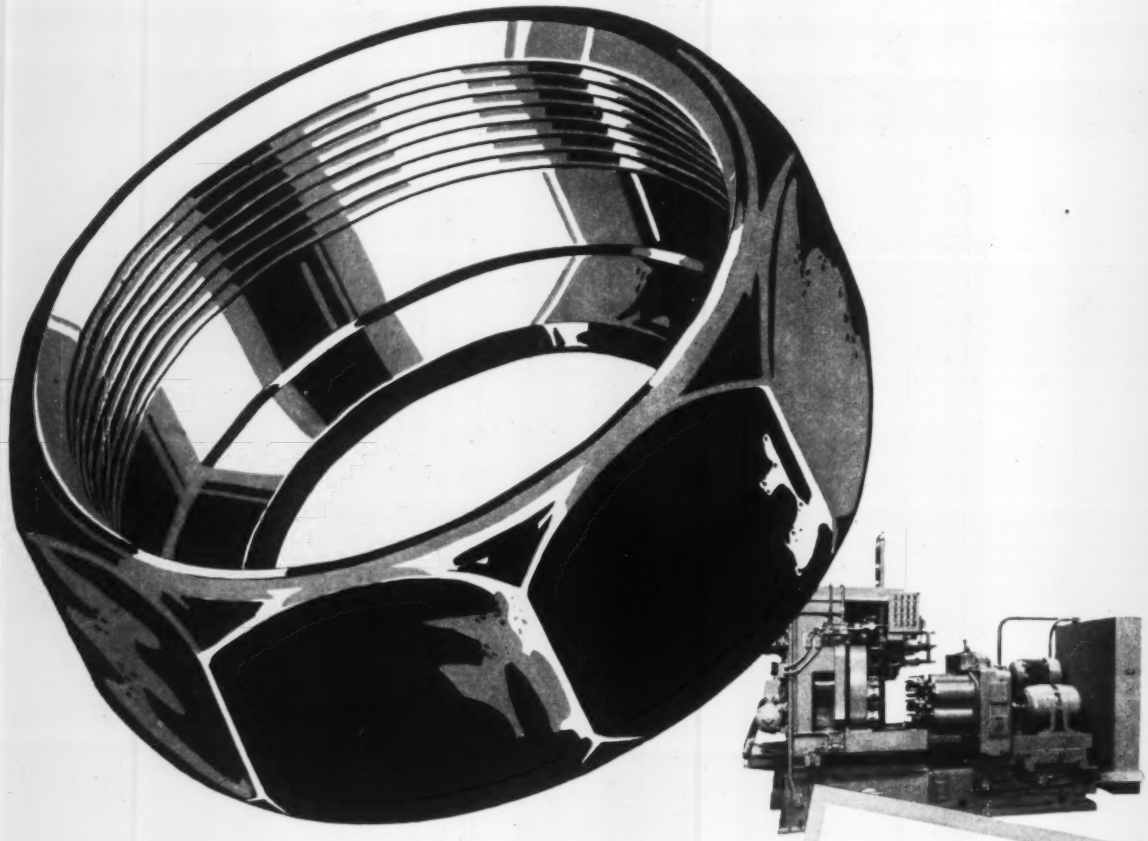
**PERMANENT MAGNETS**

*— and many others*

## CRUCIBLE STEEL COMPANY OF AMERICA

Branch Offices and Warehouses: Atlanta • Baltimore • Boston • Buffalo • Charlotte • Chicago • Cincinnati • Cleveland • Columbus • Dallas • Dayton Denver • Detroit • Erie, Pa. • Grand Rapids • Harrison • Houston • Indianapolis • Kansas City • Los Angeles • Milwaukee • New Haven New York • Philadelphia • Pittsburgh • Portland, Ore. • Providence • Rockford • Salt Lake City • San Francisco • Seattle • Springfield, Mass. St. Louis • St. Paul • Syracuse • Tampa • Toledo • Tulsa • Toronto, Ont.

*...an example of Automatic Production by Greenlee...*



# 700 malleable iron pipe fittings an hour...

The Greenlee 5 station, horizontal, automatic indexing machine shown above was designed and built for high-production machining of malleable iron pipe fittings. The pipe fittings are loaded, four at a time, indexed and machined at the rate of 576 to 712 pieces an hour, depending on size. The machine accommodates five different sizes of fittings.

STATION 1 — automatic load
STATION 2 — bore and rough counter-bore
STATION 3 — finish counter-bore and chamfer
STATION 4 — tap
STATION 5 — automatic unload

Let a Greenlee representative show you the modern Greenlee approach to automatic production.

*MACHINES DESIGNED . . .*
*WITH THE FUTURE IN MIND*

GREENLEE

## TRANSFER MACHINES

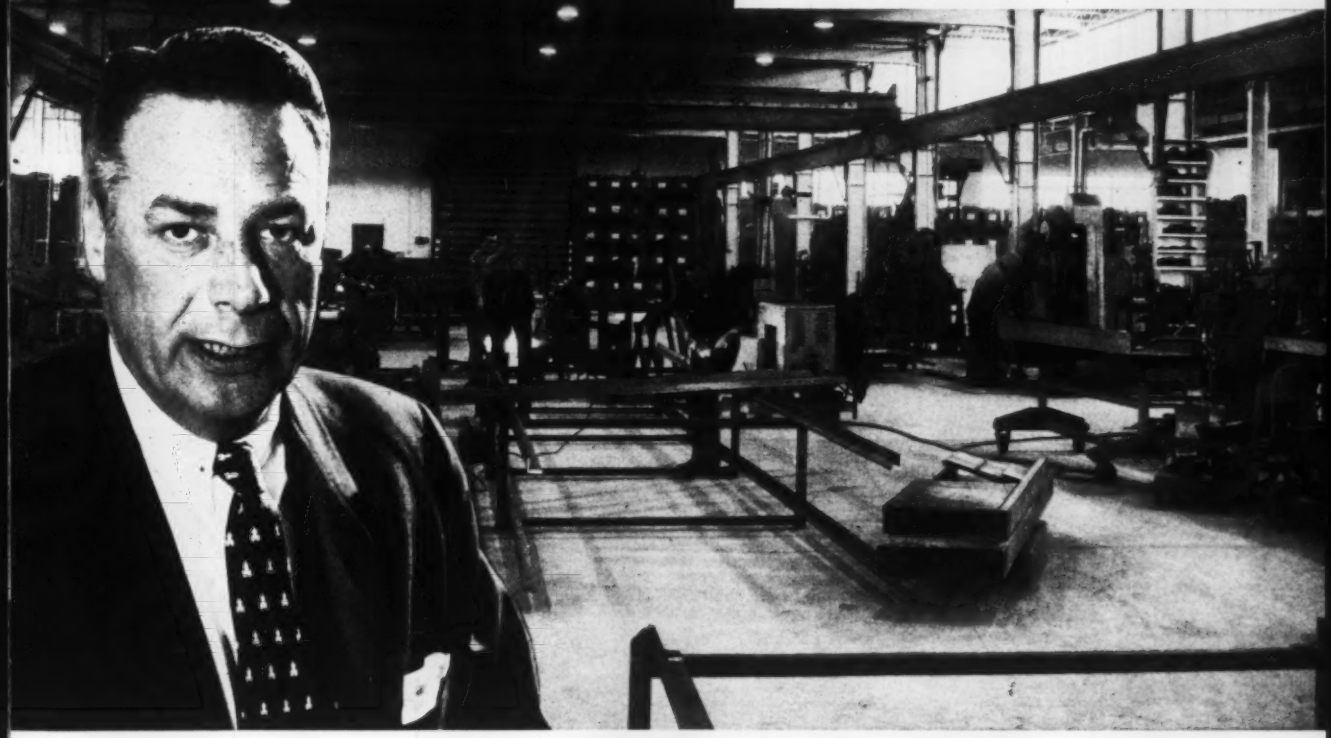
GREENLEE STANDARD AND SPECIAL MACHINE TOOLS

- Multiple-Spindle Drilling and Tapping Machines
- Six and Four-Spindle Automatic Bar Machines
- Hydro-Borer Precision Boring Units
- Die Casting Machines
- Trim Presses

**GREENLEE BROS. & CO.**

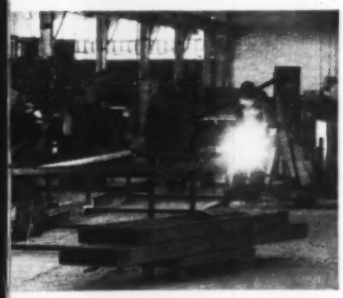
**1702 MASON AVE.**
**ROCKFORD, ILLINOIS**

**LIGHTEN your inventories . . . BRIGHTEN your profits . . . WIDEN your markets . . .** A Steel Service Center can help you achieve all three, so why not take a long, hard look at your steel buying policies. Maybe you can reduce inventories, increase profits and open up new markets by purchasing more steel as you need it, ready for production, from modern Steel Service Centers.



# "We're saving $420,000 in inventory space!"

## says Mr. Marvin H. Coleman, President, Conveyor Systems, Inc., Morton Grove, Ill.



This is hard-working production area. A small inventory keeps it that way.

Mr. John Drangine checking inventory. It's small, yet ample. Never overstocked!

"Today, we utilize only 6,000 square feet of space for our immediate steel needs," says Mr. Coleman. "But, if we were forced to stock all of our material requirements it would take at least 50,000 square feet of in-plant area.

"This would mean setting aside an additional 42,000 square feet. And, at the rate of $10.00 per square foot, it sums up to a dead space investment of $420,000, depreciated not in five or ten years, but over a twenty-year period. However, we've eliminated this problem by dealing with U.S. Steel Supply and getting prompt, efficient delivery of the steel we need . . . when we need it.

Why not take a close look at your steel buying policies—you'll find U.S. Steel Supply's pamphlet entitled "Value Analysis at Work" very helpful. Write to our Chicago Office, or call your nearest U.S. Steel Supply Steel Service Center. You'll find us in the Yellow Pages listed under *Steel*.

*USS is a registered trademark*

**U.S. Steel Supply Division of United States Steel**

USS

**Steel Service Centers and Complete Steel Strapping Service at: Baltimore, Birmingham, Boston, Chicago, Moline, Cleveland, Houston, Dallas, Los Angeles, Milwaukee, Newark, Southington (Conn.), Philadelphia, Seattle, Portland (Ore.), Pittsburgh, St. Louis, St. Paul, San Francisco.**

**General Offices: 208 South LaSalle Street, Chicago 4, Ill.**

299 - H. H. Scott 40 Watt Stereo Amplifier

# HI-FI QUALITY SECURED AT LOWER ASSEMBLY COSTS

***Thomson Rivets and Rivet-Setting Machines used by H. H. Scott to standardize fastening procedures.***

Any high fidelity hobbyist will tell you that H. H. Scott, Inc., Maynard, Mass., makes America's top quality in high fidelity equipment.

Here you see one of the finest stereo amplifiers made . . . in both chassis and final form. Components are securely and accurately held in uniform tension by 113 Thomson Rivets. H. H. Scott has standardized on Thomson aluminum rivets in one diameter and four lengths.

Rivets get their uniform clinch from any one of the eight Thomson Automatic-Feed Rivet-Setting Machines which H. H. Scott now uses.

All eight machines have identical tooling except for interchangeable anvils. Several sets of numbered, color-coded anvils cover all variations in assembly thickness. Change-over time is a matter of seconds.

E. G. Dyett, Jr., Purchasing Agent of H. H. Scott, reports, "The use of Thomson rivets and rivet-setting machines has produced assembly economies and resulted in lower over-all costs, while improving product appearance and mechanical construction."

Chances are the Thomson Fastening Man can help you improve product quality and reduce your costs. It costs nothing to find out. Make a date with him soon. You'll find him listed in the yellow pages of your phone book. In the meantime, you'll want Thomson's latest catalog. Write today for your free copy to Dept. S

*Style 161*
*Thomson Automatic*
*Rivet-Setting Machine*

JTL

JUDSON L.

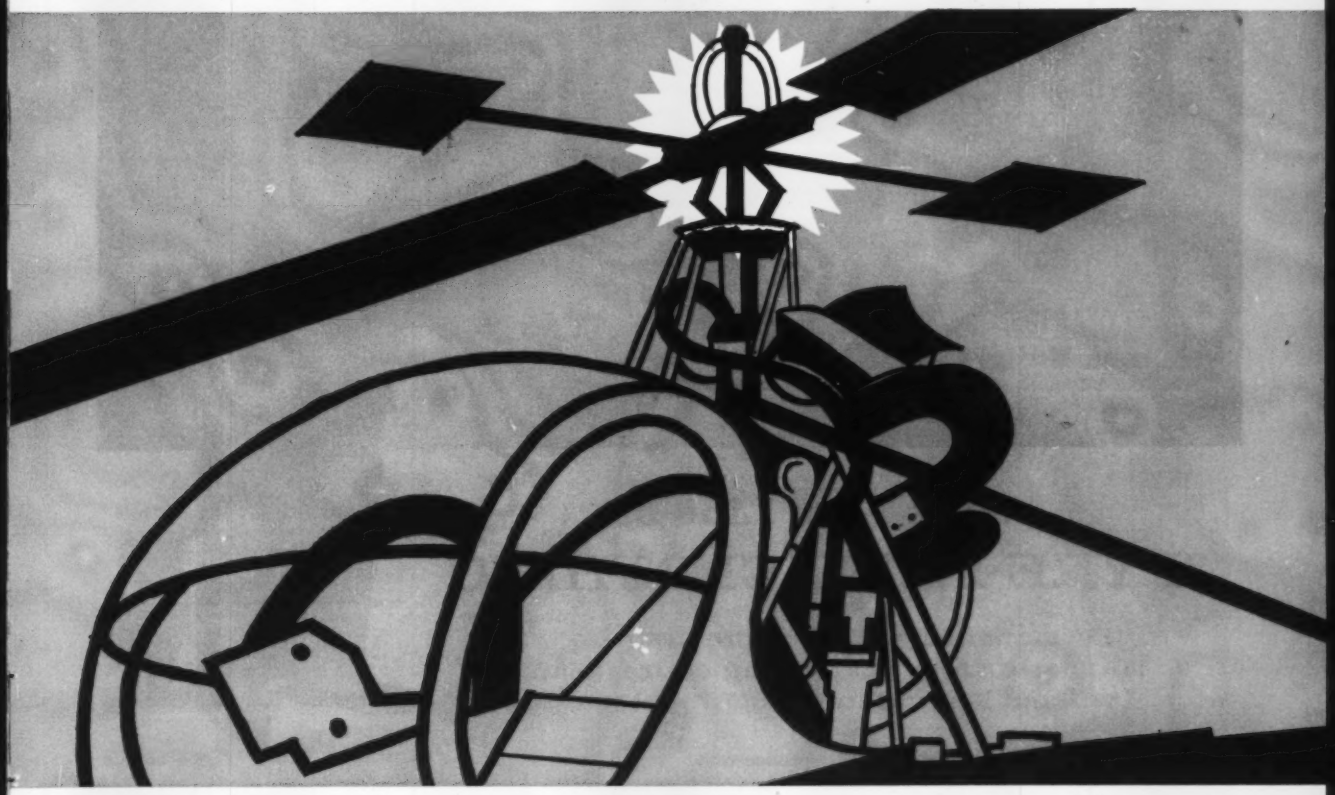
**THOMSON**

MFG. CO., WALTHAM 54, MASS.

Offices: NEW YORK • ILLINOIS • INDIANA • OHIO • MICH. • PENN. • CALIF. • FLORIDA • TEXAS • S. CAROLINA • MO. • ONTARIO, CANADA.

ANOTHER NEW AIRCRAFT COMPONENT MADE OF BYERS AMBALLOY STEEL

# AMBALLOY HIKES CAPABILITIES OF VITAL PARTS



**Mighty mite.** This straight bevel gear for power unit of Hiller Helicopter has a workhorse assignment demanding plenty of strength and stamina. Made of AISI-E 9310 Byers Amballoy Steel to Specification AMS 6260E at Vard, Inc., Pasadena.

*How technically competent is your source of aircraft quality steels? Byers Amballoy steel users are served by trained metallurgists. Amballoy is uniform in workmanship, quality and cleanliness. Amballoy cuts rejections, improves product performance, meets exacting requirements.*

Evaluating materials for ultra-critical aircraft and missile applications? Consider Amballoy. Byers high-quality specialty steels boost performance of gear blanks, motor hubs, upset sections, tension rods, screw shafts, steering knuckles, piston assemblies, high stressed latch and catapult hooks, flanges, and gusset plates. Versatile Amballoy is increasing payload factors in scores of longitudinally and transversally loaded parts. For details, write: A. M. Byers Company, Clark Building, Pittsburgh 22, Pennsylvania.

*aircraft quality steels from a technically competent source*

**A. M. BYERS COMPANY**

MAKE THE MATCH TEST
It may smoke but it will not burn!
Meets American Standards Association
Requirements for Flameproofed Fabrics.

## Fyre-Free Clothing

AO Fyre-Free Clothing is recommended for Spot Welding, Drop Forging, Light Metal Splash and similar exposures.

# AO's New Line of "FYRE-FREE" CLOTHING

### Permanent-Type Flameproofing—takes laundering after laundering or dry cleaning without loss of flameproofing properties

Here's a new line of protective, comfortable work clothing which fills a real need of many workers (and safety directors and industrial purchasing departments).

American Optical "Fyre-Free" Clothing combines the soft feel of an untreated material with the protection of permanent-type flameproofing. The fabric is 100% cotton cloth weighing approximately 11 to 11½ ounces per square yard finished. It has good tensile strength in both warp and fill . . . is long lasting . . . mildew resistant . . . and does not deteriorate in damp climates or operations.

American Optical "FYRE-FREE" CLOTHING CAN BE LAUNDERED AS MANY AS TEN TIMES WITHOUT LOSS OF ITS FLAMEPROOFING PROPERTIES. If exposed to flame there is no afterflame or afterglow.

Available in a complete line of Sleeves, Cape Sleeves with or without Bibs, Regular and Split Leg Aprons, Overalls, Coats, Coveralls, Hip Leggings and Pants. Your nearest American Optical Safety Products Representative can supply you.

*Always insist on AO Trademarked Safety Products*

American Optical COMPANY
SAFETY PRODUCTS DIVISION

1833-1958 • 125 LEADERSHIP YEARS

**Southbridge, Massachusetts**
*Branches in Principal Cities*

# style is stainless steel

Stainless Steel is the only surfacing material with a hard lustrous finish that is always in style, withstands exposure to all kinds of wear and has a low maintenance cost for the life of the building.

No other metal offers the freedom of design and fabrication, economy of care and the durable beauty that serves and sells like Stainless Steel.

McLOUTH STEEL CORPORATION, Detroit 17, Michigan

specify

**McLOUTH STAINLESS STEEL**

HIGH QUALITY SHEET AND STRIP

for architecture

LOOK FOR THE DIAMONDS—SIGN OF FINISHING QUALITY

# Now-28 ISOBRITE® PLATING BRIGHTENERS

## For Zinc, Cadmium, Copper and White Brass

## HAVE THE *FOUR* BIG FEATURES YOU ASKED FOR!

When the Allied line of brighteners, now known as ISOBRITE, had the famous ARP trademark on them, we made a survey to find out exactly what *you* wanted most in brighteners. Your answers helped guide our research and development staff in evaluating and consolidating our new line.

Now, here are the results—the industry's most complete line—28 *ISOBRITE Brighteners with these most-wanted features:*

**1. LONGER LIFE**

Your own records will show ISOBRITE Brighteners give longest possible life in rack or barrel plating operations.

**2. BRIGHTNESS**

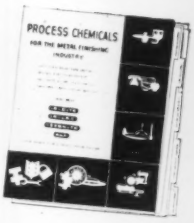
You'll see for yourself that ISOBRITE Brighteners give a diamond-like sparkle that just can't be matched.

**3. THROWING POWER**

Even if your product has deep recesses, you'll get a uniform, all-over brightness that only ISOBRITE Brighteners can give you.

**4. WIDER BRIGHT RANGE**

ISOBRITE Brighteners operate efficiently over exceptionally wide current density ranges and have greater tolerance for temperature change.




Remember, there's an ISOBRITE Brightener especially designed for your specific operations—whether you're rack or barrel plating zinc, cadmium, copper or white brass . . . an ISOBRITE Brightener that is entirely compatible with most other brighteners. Don't just order brighteners—specify ISOBRITE. There *is* a difference!

**Your Allied Finishing Systems Engineer will be glad to discuss the benefits of ISOBRITE Brighteners in your operations. He's listed in your 'phone book under "Plating Supplies." Or, write for technical data and product list giving details of your operations.**

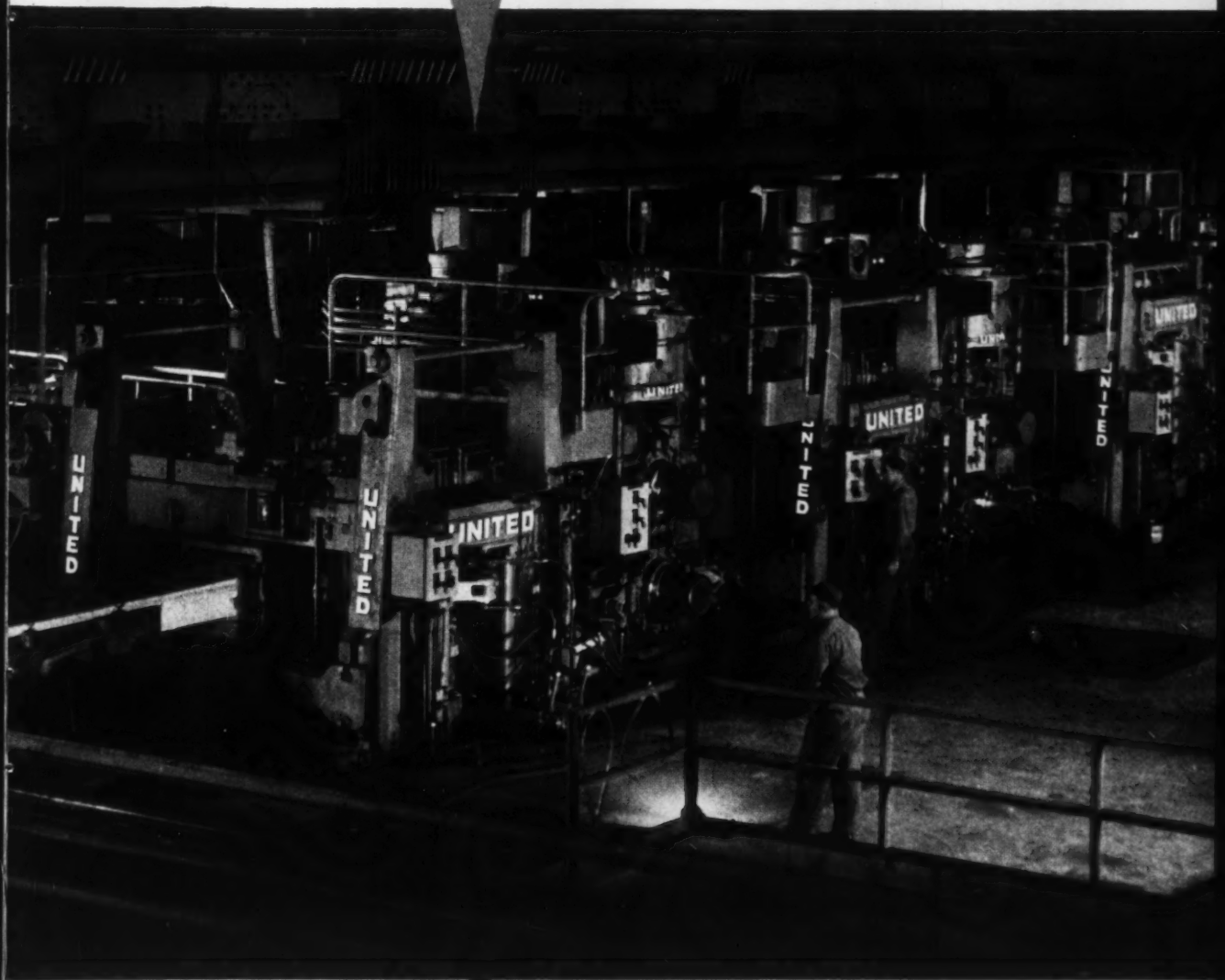
*Allied Research Products, Inc.* 4004-06 EAST MONUMENT ST., BALTIMORE 5, MD.
Branch Plant: 400 Midland Avenue, Detroit 3, Michigan
West Coast Licensee for Process Chemicals: L. H. Butcher Co.

*Chemical and Electrochemical Processes, Anodes, Rectifiers, Equipment and Supplies for Metal Finishing*

IRIDITE® Chromate Coatings | IRILAC™ Clear Coatings | ISOBRITE® Brighteners | ARP® Plating Chemicals | WAGNER Equipment

# UNITED®

*6–Stand continuous horizontal and vertical Billet Mill*




**UNITED ENGINEERING AND FOUNDRY COMPANY**
**PITTSBURGH, PENNSYLVANIA**

*Plants at* Pittsburgh, Vandergrift, Youngstown, Canton, Wilmington

SUBSIDIARIES: Adamson United Company, Akron, Ohio; Stedman Foundry and Machine Co., Inc., Aurora, Indiana

Designers and Builders of Ferrous and Nonferrous Rolling Mills, Mill Rolls, Auxiliary Mill and Processing Equipment, Presses and other heavy machinery. Manufacturers of Iron, Nodular Iron and Steel Castings and Weldments.

for strength,
corrosion
resistance
and safety...

**it had to be Stainless**

*This window washer anchor is fabricated from Carpenter Stainless No. 4-A (Type 304) for use with window hardware on skyscrapers in large cities. Men attach their safety belts to these anchors while washing the windows. Stainless is used for maximum corrosion resistance and strength in atmospheric conditions. In fabrication, the forging bars must flow freely without tendency to rupture. Since switching to Carpenter, the forging shop has reduced rejections because of the cleaner, defect-free surfaces. The Carpenter representative near you can supply close metallurgical cooperation and complete technical data on your stainless requirements. The Carpenter Steel Company, 139 W. Bern Street, Reading, Pa.*

**Carpenter STEEL**

**The Carpenter Steel Company**

*Main Office and Mills, Reading, Pa.*
*Alloy Tube Division, Union, N. J.*
*Webb Wire Division, New Brunswick, N. J.*
*Carpenter Steel of New England, Inc., Bridgeport, Conn.*

# going places...

**Designed to handle heavy duty applications, CIMPERIAL is the new chemical cutting fluid that has already won nation-wide acceptance. Wherever used, CIMPERIAL scores new production records, particularly on low clearance, low speed, heavy cut jobs—previously limited to cutting oils.**

SALES REPORT

2

a sub-contract making cone exits for missiles.

A 17-inch pass to bore a taper inside the cone (normalized 4130 steel). 5/8" of metal to be removed.

With the former coolant it took 7 passes and they needed a new tool bit each time.

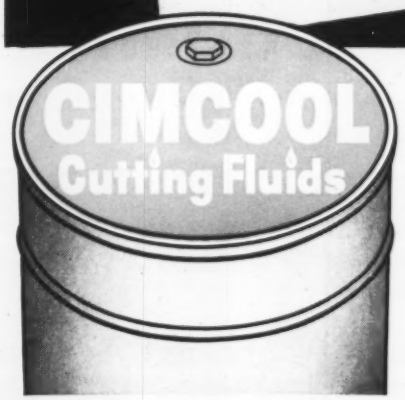
They put in Cimperial (at 1:15 dilution). Now it takes only 3 passes—all with the same tool.

Work piece is much cooler, even with bigger cut. Chatter eliminated entirely. Production more than doubled and tools last 7 times as long, with Cimperial. It really pulled them out of a hole on deliveries.

Bill Crawford

Los Angeles Office

*Firm name available on request.




FOR 100% OF ALL METAL CUTTING JOBS

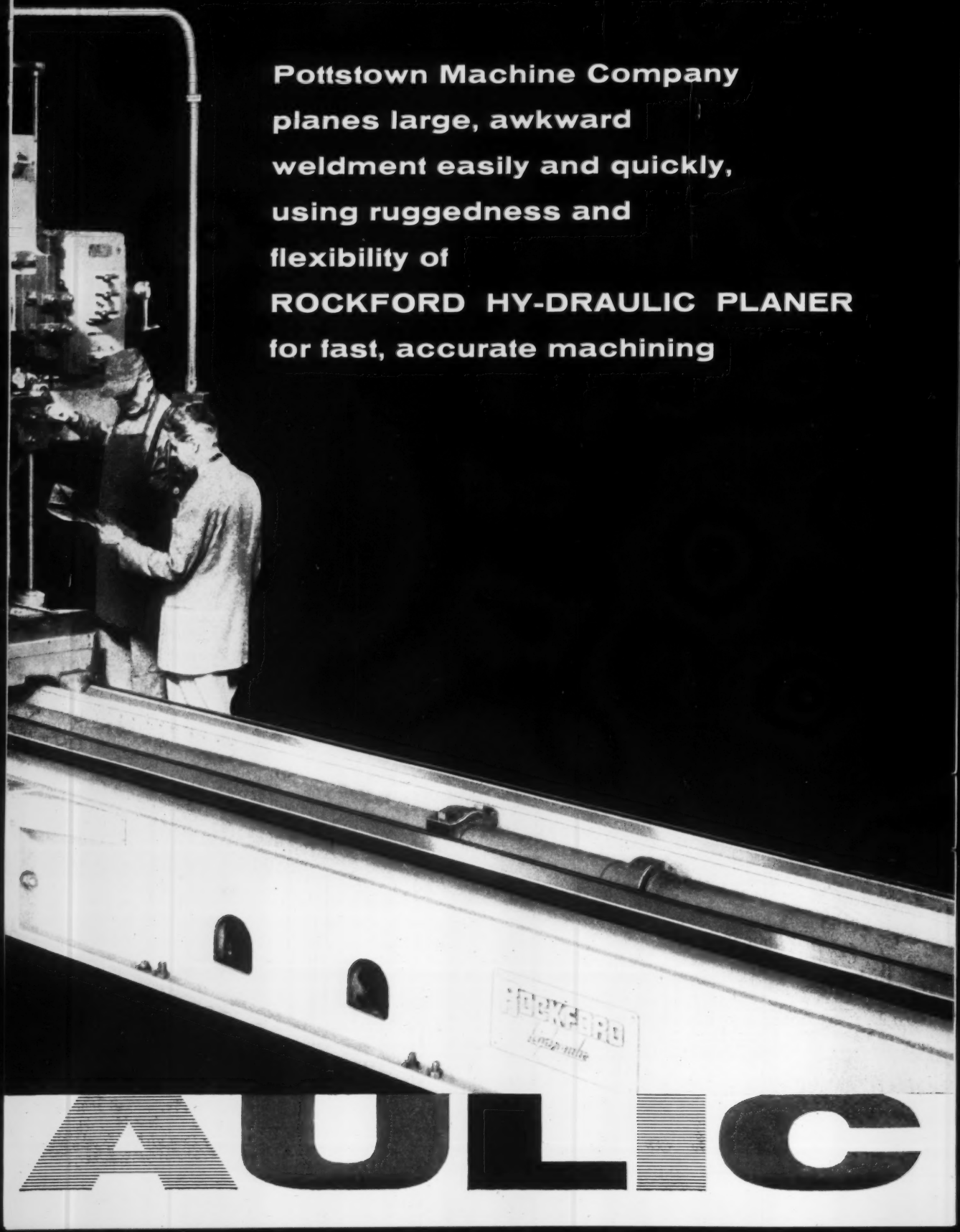
*Production-proved products of The Cincinnati Milling Machine Co.*

**CIMPERIAL**—newest in the famous, industry-proven line of CIMCOOL® Cutting Fluids!
**CIMCOOL S2 Concentrate**—The pink fluid which covers 85% of all metal cutting jobs.
**CIMPLUS**—The transparent grinding fluid which provides exceptional rust control.
**CIMCUT Concentrates (AA, NC, SS)**—For every job requiring an oil-base cutting fluid.
**ALSO—CIMCOOL Tapping Compound—CIMCOOL Bactericide—CIMCOOL Machine Cleaner.**

For full information on the complete family of CIMCOOL Cutting Fluids, call your CIMCOOL Distributor. Or contact Cincinnati Milling Products Division, Cincinnati 9, Ohio.

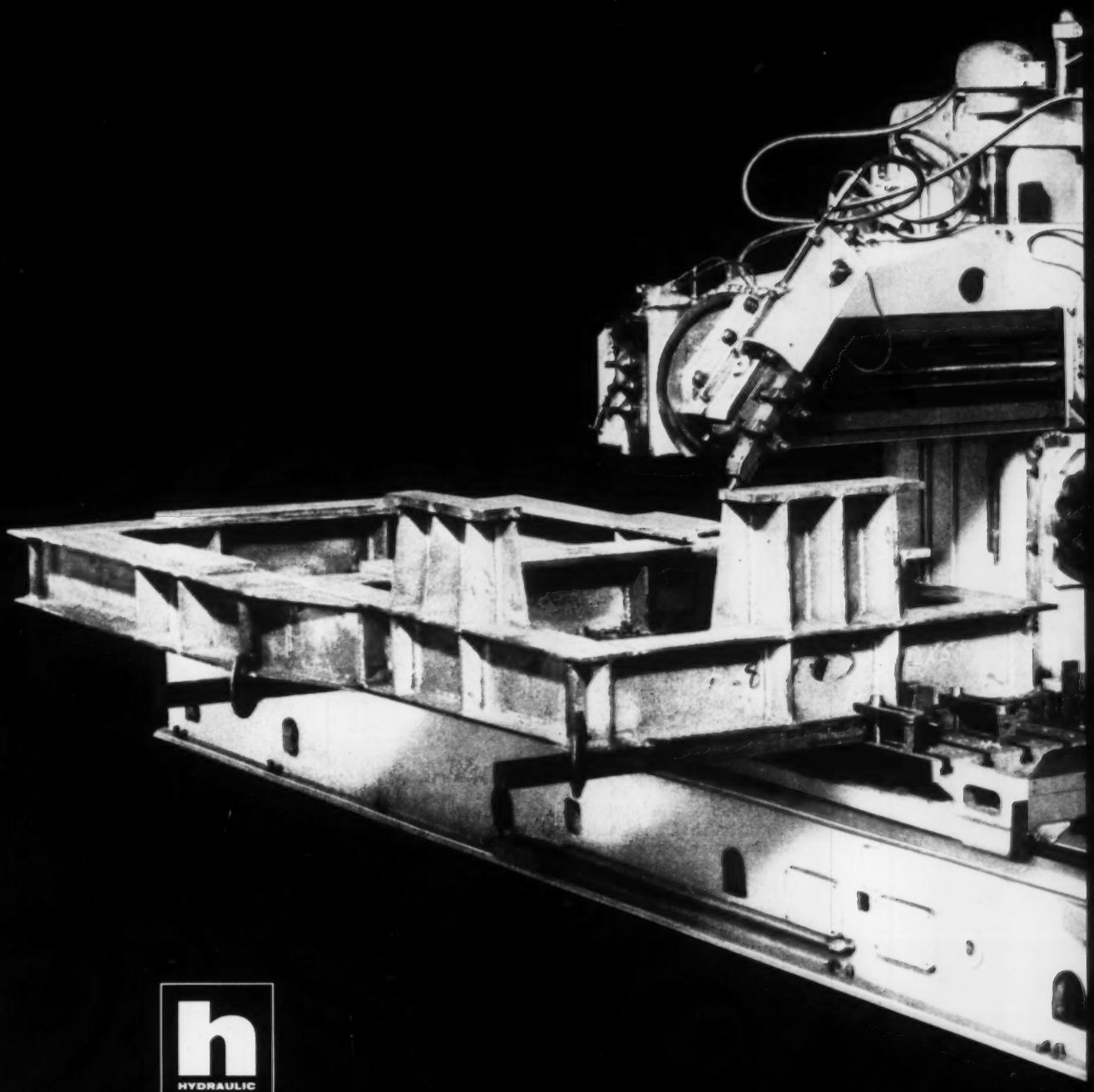
®Trade Mark Reg. U.S. Pat. Off.

# THIS HANGOVER IS NOT A HEADACHE!



Pottstown Machine Company
planes large, awkward
weldment easily and quickly,
using ruggedness and
flexibility of
ROCKFORD HY-DRAULIC PLANER
for fast, accurate machining

AULIC



HYDRAULIC

ROCKFORD MACHINE TOOL CO. 2500 KISHWAUKEE STREET ROCKFORD, ILLINOIS

# HY-DR

# FRASSE ALUMINUM

## helps tell how she's doing!

Ballistic missile success hinges on intelligence obtained in test firings. Tracking data – reporting velocity, direction, altitude, temperature, etc. is vital – when processed, it guides critical design changes.

Heart of the intricate data processing system at Cape Canaveral is a Potter Magnityper – a high speed electronic printer that decodes raw material . . . then stores, collates, interprets and prints at 72 *thousand* characters per minute. Lightweight, non-magnetic aluminum is essential to its efficient operation – that's why the Magnityper is made almost completely of Frasse aluminum.

Frasse ships the required sizes quickly from stock – in the grades that contribute to its ease of fabrication *and* performance. For example, Frasse supplies 2024-T4 bars for *strength* and *machinability*, 5052-H34 sheet for *formability* and *weldability* and "775" tooling plate for *dimensional accuracy* with *no distortion when worked.*

Perhaps these same qualities can increase the efficiency of *your* product – or reduce fabricating costs. It's worth investigating – and a Frasse aluminum specialist will be glad to help. There's no obligation – simply write or call your nearest Frasse office. You'll be glad you did.

***Call FRASSE for ALUMINUM***

**Screw Machine Stock • Bars • Rods • Wire Sheets • Plates • Tubing • Holobar Pipe • Fittings • Valves • Extrusions Tool and Jig Plate**

**Peter A. Frasse & Co., Inc.**

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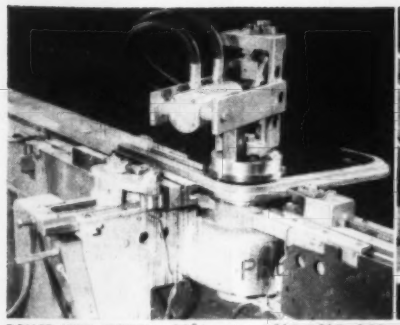
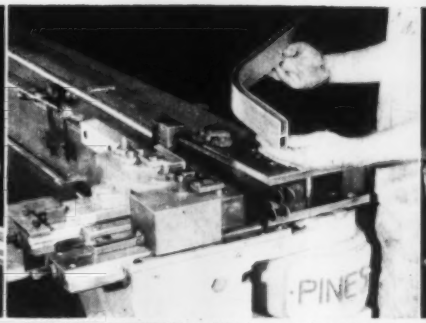
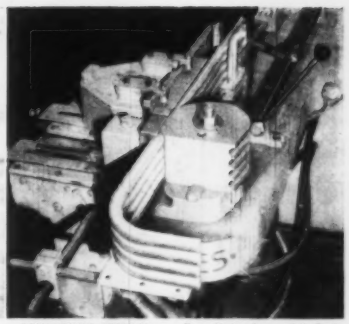


**ROLLED-STEEL SECTION**—90° bends in 1¾"x1¾"x.059 stock produce automobile seat frames. Split dies with automatic actuator make possible speeds up to 500 bends per hour.



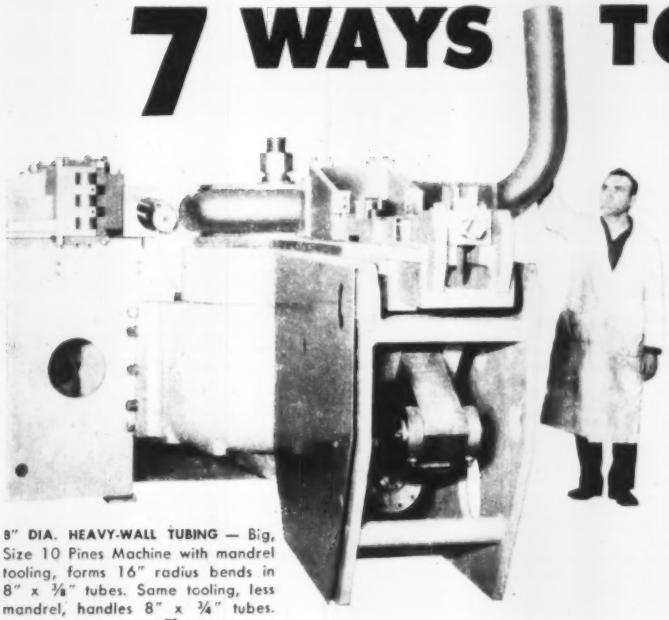
**ALUMINUM EXTRUSION** — Window awning ribs are accurately formed on a 5¾" inside radius using leaf-spring mandrels. Split-die tooling speeds loading and unloading operations.



**ALUMINUM TUBING** — Bending four 1" O.D. x .035 workpieces simultaneously on a 3½" CLR produces up to 1200 pieces per hour for large furniture plant.

# 7 WAYS TO CUT COST

## Production Bending . . . the "PINES-WAY"



**8" DIA. HEAVY-WALL TUBING** — Big, Size 10 Pines Machine with mandrel tooling, forms 16" radius bends in 8" x ⅜" tubes. Same tooling, less mandrel, handles 8" x ¾" tubes. Holds flattening to 8%, thinning on outside to 10%.

Hundreds of metalworking plants have found it possible to effect substantial savings by applying Pines Machines in fabricating a wide range of tubing, pipe, extruded or rolled-shaped parts. As illustrated, they are profitably used today on large or small work, and on both short as well as long run jobs. Production-wise and cost-wise, you will find bending the "Pines-Way" is a fast, accurate metal forming method. For assistance with any job or a cost analysis, call on Pines Engineers without obligation.

***Write*** **FOR FREE DATA SHEETS**

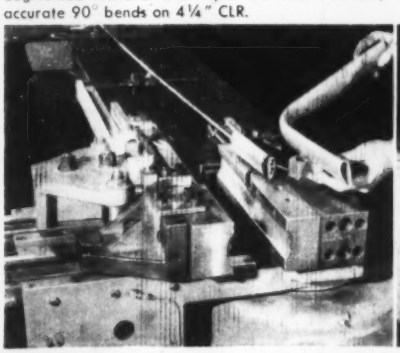
For additional cost cutting ideas write for free copies of "Pines News" — illustrates latest bending techniques applied to actual jobs.

**PINES ENGINEERING CO., INC.**

Specialists in Tube Fabricating Machinery

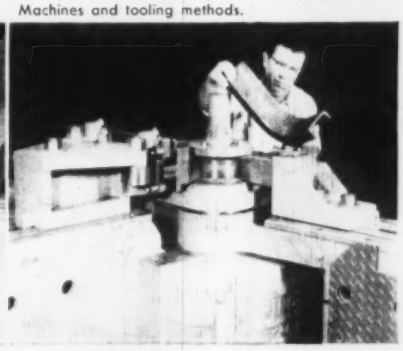
662 WALNUT • AURORA, ILLINOIS

**AIRFOIL SHAPE**—$13/16$" x $2\frac{1}{16}$" aluminum aircraft struts are now rapidly formed at production speeds. Segmented mandrel and wiper die insure smooth, accurate 90° bends on 4¼" CLR.



**HEAT EXCHANGER COILS** — This tooling set-up produces accurate 180° serpentine bends in 2" O.D. x .065 tubing on 2½" CLR. Operating speed is 150 bends per hour.

**STEEL CHANNELS** — Bending heavy 4" x 5.40# steel channels on a 3½" I.R. for truck frames is another example of the versatility and efficiency of Pines Machines and tooling methods.



## Gets finer finishes, reduces lapping time, boosts

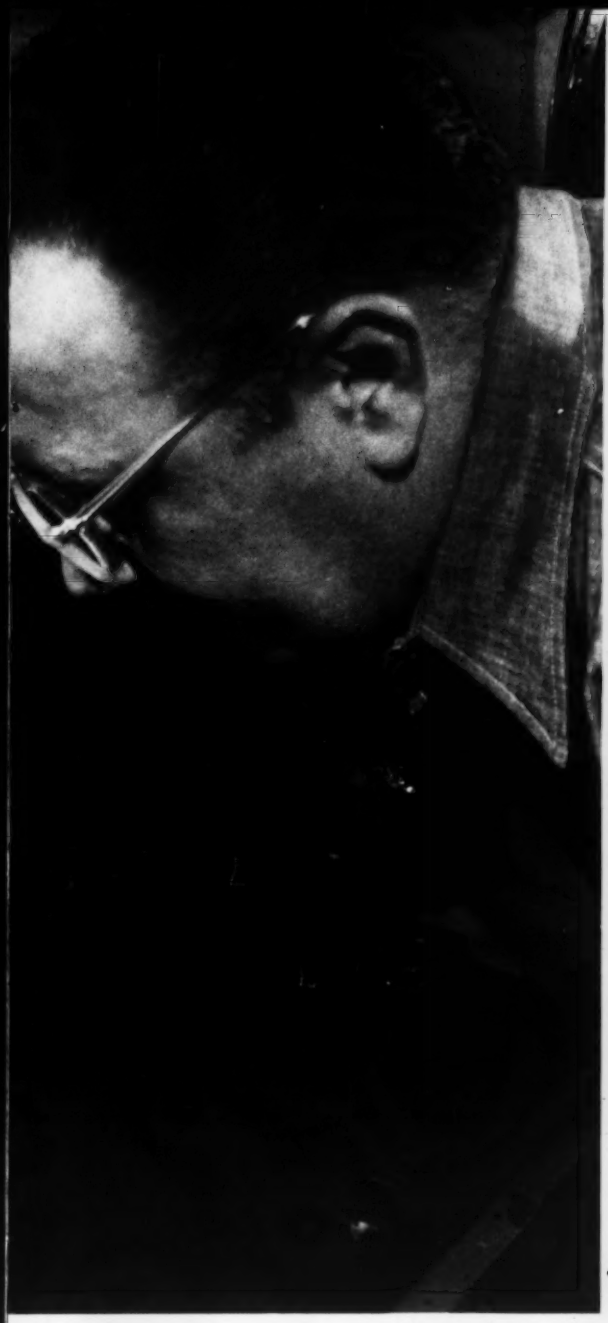
# GULF MAKES THINGS

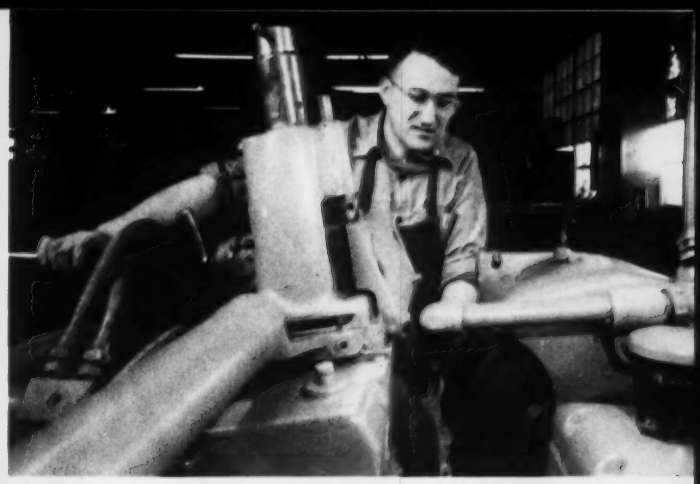
"Before we switched to Gulfcut Heavy Duty Soluble Oil, our previous emulsions had permitted ground finishes of about 11 micro-inches on valve components. Now we average 6 to 8 micro-inches. As a result, we have reduced lapping time to a minimum and improved production more than 10%."

So reports Mr. Charles Grillo, Machine Shop Foreman at the Hancock plant of Manning, Maxwell & Moore, Inc., Watertown, Mass. The company is a leading manufacturer of valves, gauges, electronic process controls, hoists, cranes, and a wide variety of other precision-built equipment for industry. Their Hancock plant produces "Hancock" bronze and steel valves (some with component tolerances of +.0000″ to —.0005″), and other products for the chemical, petroleum and power industries.

"We not only get superior finishes with Gulfcut Heavy Duty Soluble Oil," says Mr. Grillo, "but we find this oil so versatile that we use it on many jobs where we never used emulsifying oil before.

"We also find that Gulfcut Heavy Duty Soluble Oil





Grinding a 2" steel gate valve stem (Type 970) on a centerless grinder at Hancock plant of Manning, Maxwell & Moore, Inc.—where Gulfcut Heavy Duty Soluble Oil is the coolant. Work-piece is of 416 steel, "300 Brinell" hardness.

Checking a 5 to 6 micro-inch finish on a steel gate valve wedge, are, left to right, Mr. R. M. Drennan, Gulf Sales Representative, Mr. Charles Grillo, Machine Shop Foreman, and Mr. B. W. Morrison, Quality Control Superintendent at the Hancock plant.

Grinding 2" Type 970 steel gate valve wedges on a surface grinder at Hancock plant of Manning, Maxwell & Moore, Inc. Shields removed and operation suspended to show grinding wheel and work pieces in place on stock table.

## production 10% using Gulfcut . . .

# RUN BETTER!

has no unfavorable reactions with the various metals we use, including bronzes, brasses, monels, chrome and stainless steels, Stellite and others. We no longer have any problems of rancidity. No objectionable odors when working brass or bronze. No staining or corrosion of non-ferrous metals."

May we have the opportunity to demonstrate this cost cutting product? See how Gulf makes things run better. Call a Gulf Sales Engineer at your nearest Gulf office. Or mail coupon for illustrated bulletins.

GULF

**GULF OIL CORPORATION**
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Send bulletins on ☐ Gulfcut Heavy Duty Soluble Oil ☐ Gulfcut "regular" oils.

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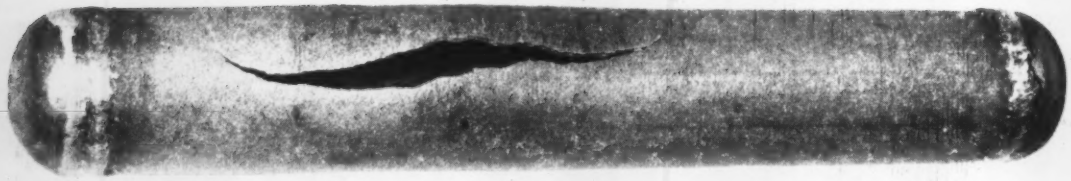
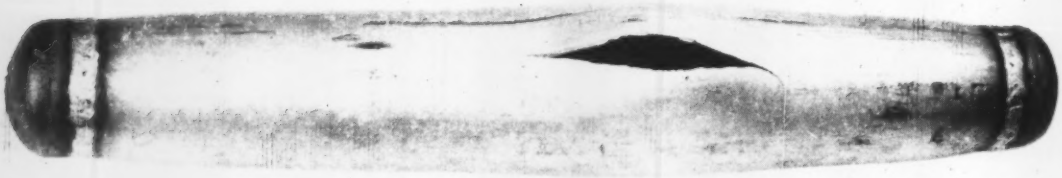
Centrifugally cast Thermalloy tube burst at 77,500 psi





Wrought tube burst at 70,100 psi

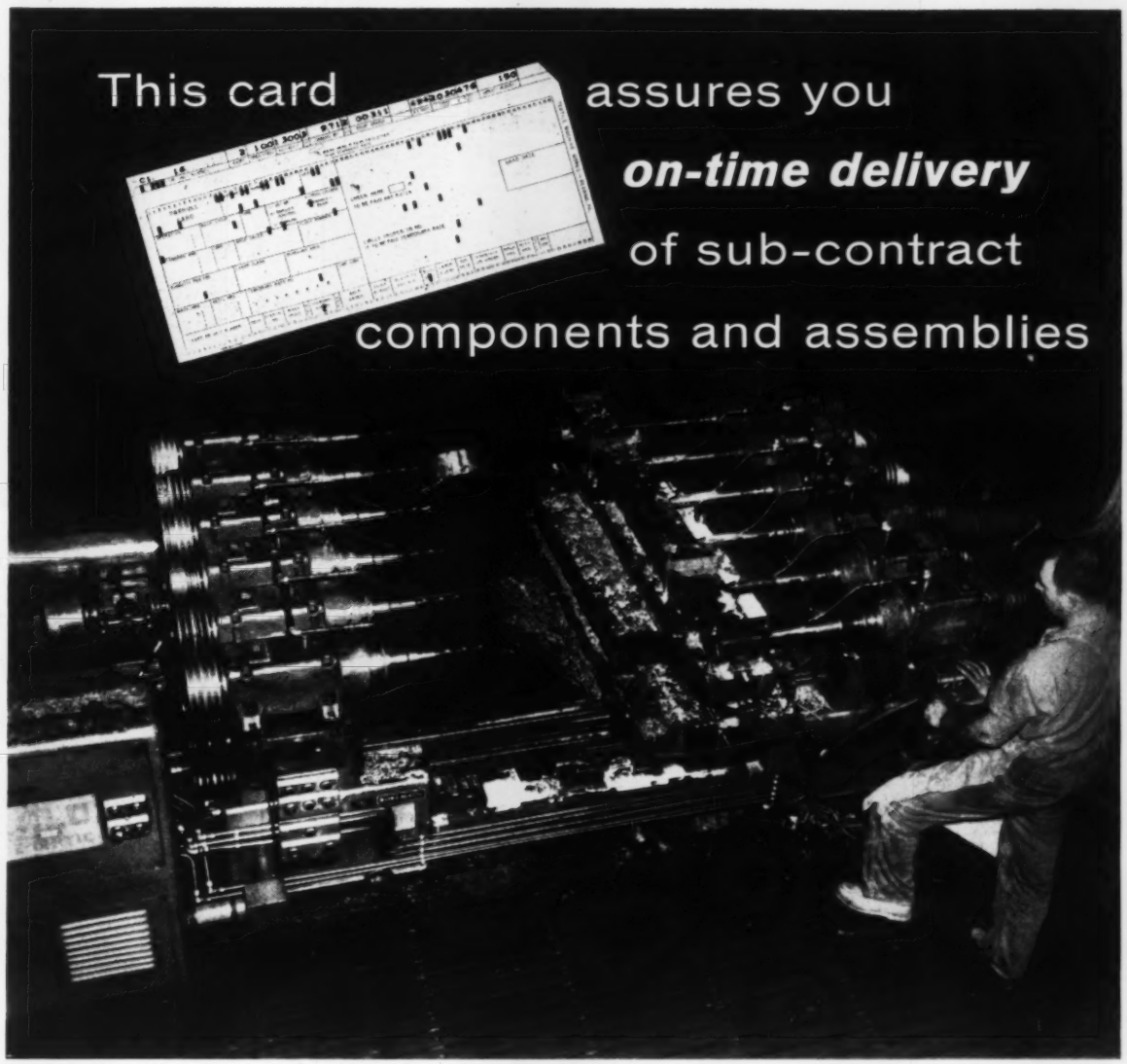
# Burst tests prove 7,400 psi superiority of centrifugally cast Thermalloy® tubes

Hydrostatic pressure tests by Electro-Alloys established the rupture of a centrifugally cast Thermalloy tube section at 77,500 psi. Under the same conditions, wrought tubes of comparable section and analysis burst at 70,100 psi. These tests were conducted at room temperatures. Tensile tests show this strength margin increases substantially at the higher operating temperatures (1200°-2200° F). The Thermalloy tube was tested *as cast* —without machining the inside or outside diameter.

Thermalloy is a group of heat-resistant alloys developed for use in the range of 1200°-2200° F. The greater strength of the Thermalloy centrifugally cast tubes makes them ideal for use in radiant tubes, retorts, rolls or other heat-resistant designs employing tubes. For further data, call your representative, or write Electro-Alloys Division, 1026 Taylor St., Elyria, Ohio.

AMERICAN Brake Shoe COMPANY

**ELECTRO-ALLOYS DIVISION • Elyria, Ohio**




It's a small but important part of TMW's electronic punched card scheduling and control system. And it's your assurance that sub-contract jobs, regardless of size or quantity, are delivered *on time*.

You get this when you work with one of the world's largest, most modern and completely integrated manufacturers, whose 65 years' experience in precision (tolerance to 10ths) manufacturing is available to you *now* on either a short or long term basis.

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Combine these facilities with modern electronic production scheduling controls and quality control techniques . . . and you've got the perfect answer to all your sub-contract problems.

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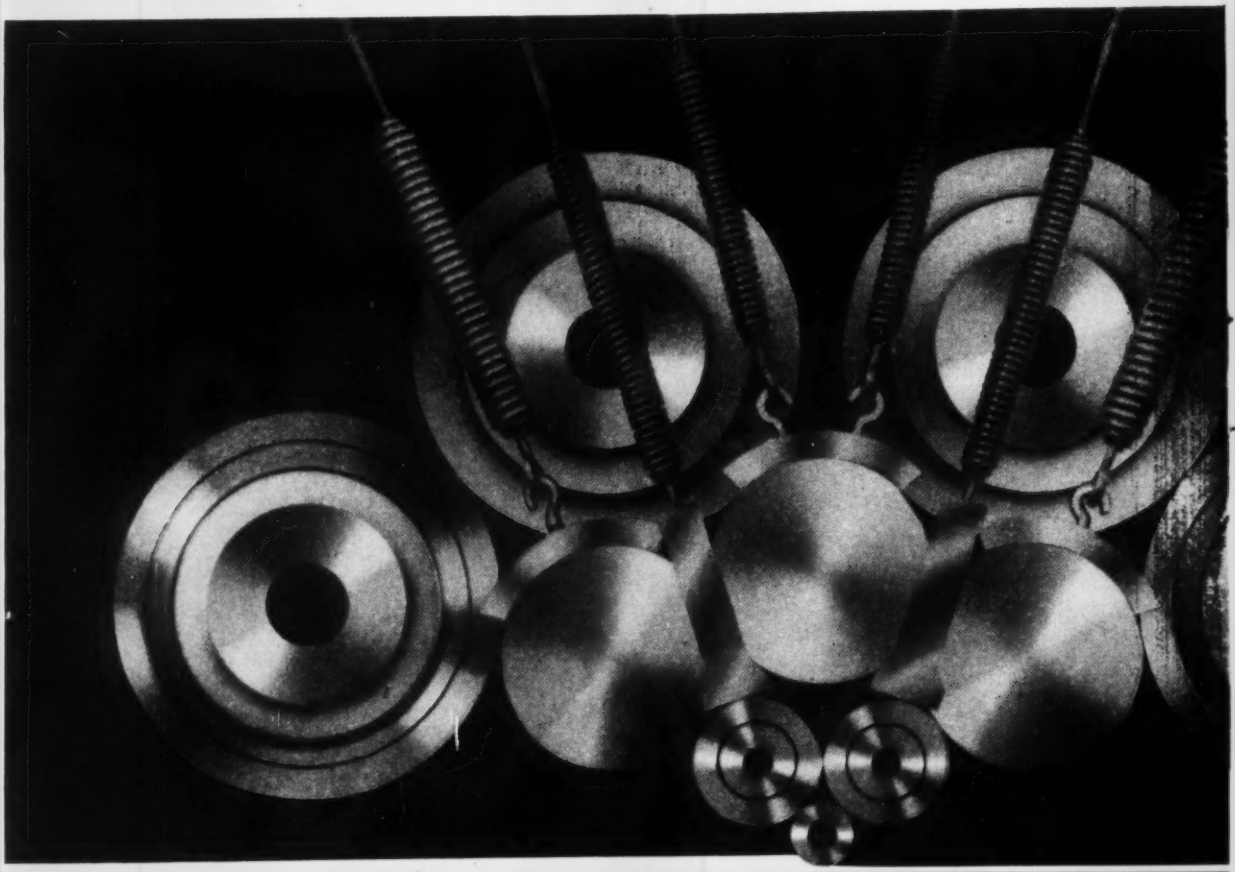
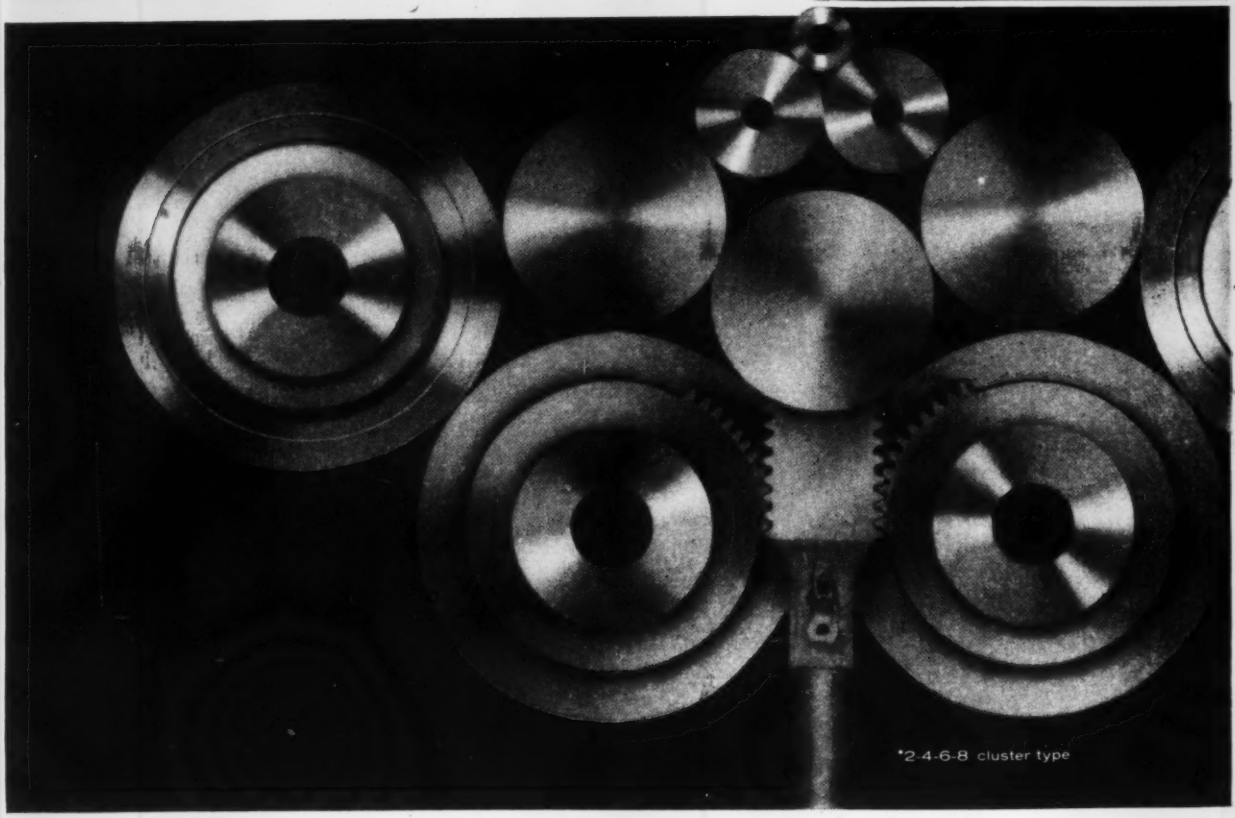
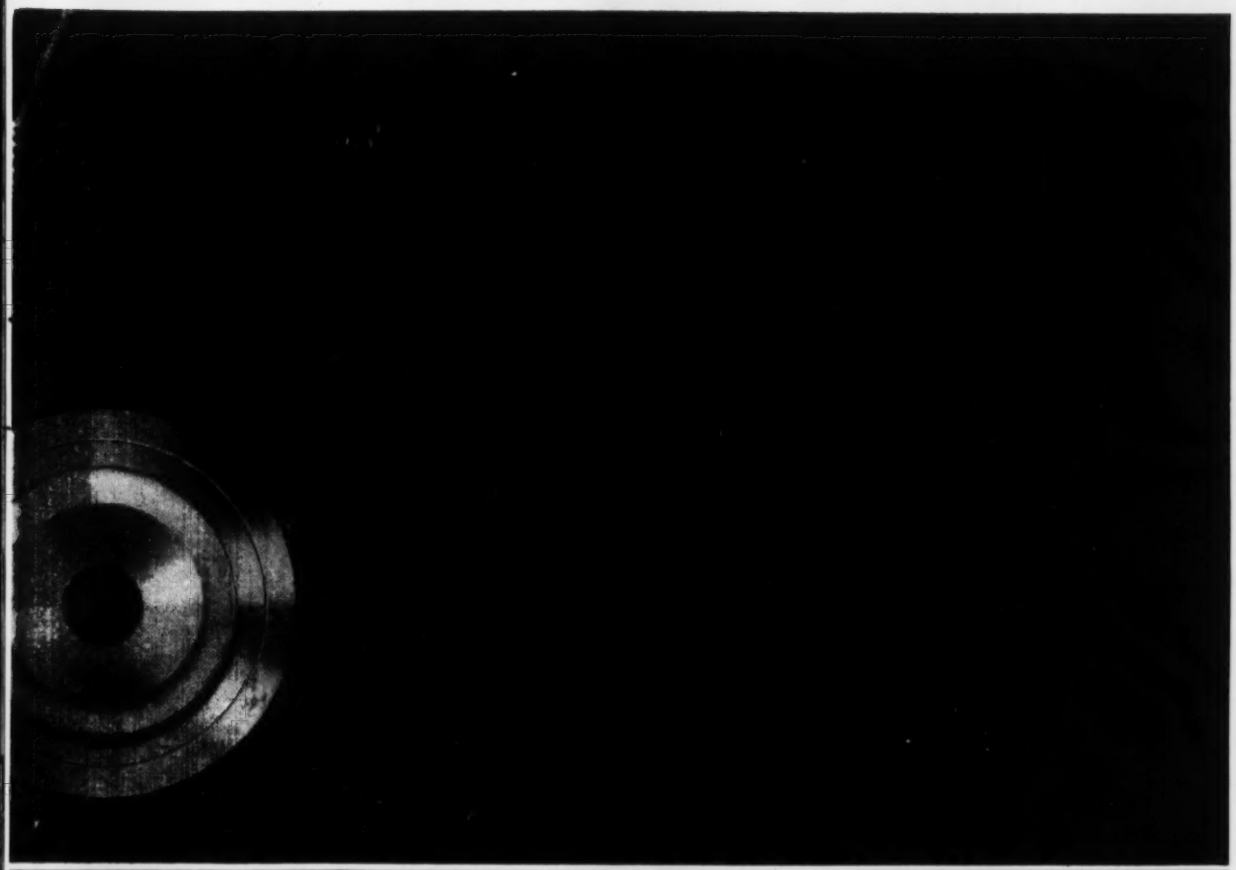
**TEXTILE MACHINE WORKS**

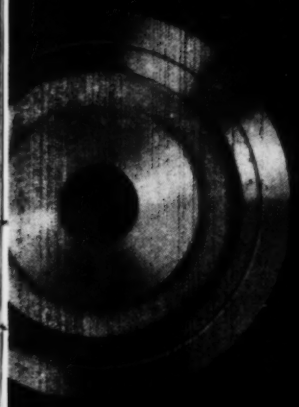
*Contract Division • Reading, Pennsylvania*





*2-4-6-8 cluster type



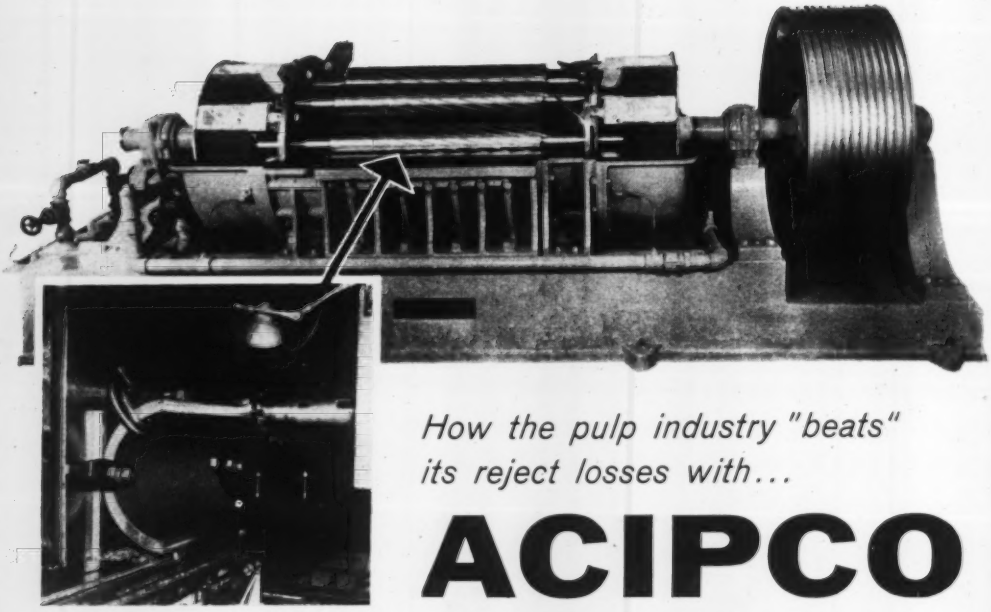


# PINPOINTED POWER

In Eastern's celebrated "Z" mill,* photo-diagrammed here, two highly finished, small-diameter work rolls pinpoint the combined power of eighteen progressively larger back-up rolls and bearings . . . to produce light gauge stainless steel sheets, coils and strip. This Sendzimir method of precision cold rolling achieves the deepest "bite" per pass . . . close-tolerance gauges down to .007" . . . widths up to 48" . . . a surface of uniformly superior quality.

Two years of "Z" Mill experience add to the assurance that Sendzimir-produced Eastern stainless steel will meet your specifications . . . accurately and always.

**EASTERN**
**STAINLESS STEEL**
BALTIMORE 3, MARYLAND, U. S. A.



*How the pulp industry "beats" its reject losses with...*

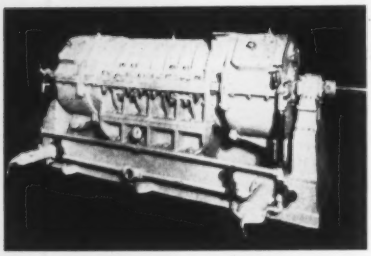
# ACIPCO

## *stainless steel liners*

**Size Range** Lengths up to 410" have been produced to meet modern machinery requirements. OD's from 2.25" to 50"; wall thicknesses from .25" to 4"

**Analyses** All alloy grades in steel and cast iron, including heat and corrosion resistant stainless steel, plain carbon steel and special analyses.

**Finished** As cast, rough machined, or finished machined, including honing. Complete welding and machine shop facilities for fabrication.



*Reject recovery with Anton J. Haug refiners is saving paper mills more than $7 million per year in wood alone! ACIPCO furnishes tough, durable, stainless steel liners which go inside the main casings of the machines.*

In Canada, Europe, South America, Japan—as well as in this nation's largest paper mills—refiners manufactured by Anton J. Haug are saving more than 700 tons of good groundwood, sulphite and kraft rejects *each day*. This refined stock is marketed at the same price as virgin pulp—and the annual savings in wood alone is more than $7 million!

ACIPCO plays an important part in reject recovery by furnishing the stainless steel lining which goes inside the main casing of the Haug refiner. The lining, statically cast to Haug's exacting specifications, fits inside a stationary cylindrical shell.

Stock, entering at one end, travels through the machine in a helical path and is *repeatedly subjected to the pressure of high speed rolls which crush it against the liners.*

In special shapes such as this, as well as centrifugally spun steel tubes, ACIPCO castings stand up . . . under the longest, toughest assignments. If *your* application is a special one, it will be worthwhile for you to investigate ACIPCO's facilities for casting, heat treating, machining, fabricating and testing.

Stainless steel, carbon steel, alloy iron or special analyses—versatile ACIPCO tubes are made to solve your specific tubular metal problem. Call ACIPCO today for complete information—or for expert technical assistance.

**Special Products Division**

**AMERICAN**

**CAST IRON PIPE CO.**

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# so quiet...

The SKIPJACK was built for the Navy by General Dynamics Corporation, Electric Boat Division.

Newest and fastest of the Navy's fabulous nuclear submarines is the SKIPJACK, designed to carry out underwater missions in utmost silence. That is why the hushed quietness of Hoover quality ball bearings makes them the first choice for critical applications. Precision-made with super-smooth *Hoover Honed* raceways and perfectly matched sets of *Micro-Velvet* balls, Hoover ball bearings contribute to the quiet, enduring performance of a wide range of products.

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Please send new Bulletin 110 which describes Hoover's full line of quality deep-groove ball bearings.

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# Questions and Answers on METALWORKING MACHINERY

...for those concerned with specifying or buying new equipment

QUESTION: Who is the largest national supplier of metalworking machinery equipment?

ANSWER: Ryerson is the largest by far – offering over 3800 different types and models produced by almost 100 of the nation's leading manufacturers.

QUESTION: What types of machinery does Ryerson offer?

ANSWER: The most complete line available anywhere, including the best type and right capacity for every metal-fabricating job of:

| | | | |
|---|---|---|---|
| Bending | Forming | Punching | Shearing |
| Braking | Hoisting | Rolling | Threading |
| Drilling | Pressing | Sawing | Welding |

QUESTION: What advantages do I get by buying from Ryerson?

ANSWER: (1) Widest selection, (2) Unbiased recommendations, (3) Double guarantee: the manufacturer's warranty backed by Ryerson assurance of satisfaction, (4) Greater continuing interest because we also value your steel and aluminum buying potential, (5) A nation-wide organization of machinery specialists backed by 117 years of Ryerson experience in working with metal fabricators and in using much of the equipment in its own steel service operations.

MACHINERY DIVISION

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PLANTS AT: NEW YORK · BOSTON · WALLINGFORD, CONN. · PHILADELPHIA · CHARLOTTE · CINCINNATI · CLEVELAND · DETROIT · PITTSBURGH BUFFALO · INDIANAPOLIS · CHICAGO · MILWAUKEE · ST. LOUIS · DALLAS · HOUSTON · LOS ANGELES · SAN FRANCISCO · SPOKANE · SEATTLE

June 15, 1959

## Metalworking's Capacity to Rise 2.7%

One in three metalworking plants will hike capacity in the coming six months, STEEL found in a survey of 6000 plant managers (Page 87). Manufacturers of instruments and related products and producers of primary metals will see the largest percentage gains in capacity. It doesn't mean an expansion boom this year, but it may signal the beginning of one. Metalworking lifted capacity only about 1.7 per cent during 1958's second half.

## Employment Hits New High

Jobholders increased to a record 66 million in mid-May—a gain of 1 million in a month. The factory workweek rose to 40½ hours—highest May average since 1955. Unemployment fell by 240,000 in the month—12 times the normal seasonal drop. It stood at 4.9 per cent of the labor force—the first time it has been below 5 per cent since November, 1957. Expect unemployment to rise in June but don't look for it to hit 4 million again this year.

## Growing Menace: Red China's Booming Industry

No laundry ticket, the markings at right spell "China's steel industry" and that spells trouble. You can expect Red China's production of capital goods to spiral 46 per cent this year and output of consumer goods to climb 34 per cent. "Production of several hundred million tons of steel within ten years is not impossible," says Hsueh Pao-ting, top economic planner. China's leaders admit the 1959 goal of 18 million tons of steel is far short of the needs of its 600 million people. But they claim last year's successes prove they can advance rapidly. Steel production rose from 5.4 million tons in '57 to 11.1 million tons in '58. Pig iron output climbed from 5.9 million to 13.7 million tons. Production of metal cutting machine tools soared from 10,000 units to 50,000. Goals for 1959: 18 million tons of steel, 23 million tons of pig iron, 75,000 machine tools (Page 99).

中國鋼鉄工業

## Signs of Economic Times Spell Good Business

New orders for industrial supplies and machinery in April were only 1.4 per cent below the record set in March, reports the American Supply & Machinery Manufacturers' Association . . . New orders in April for foundry equipment were slightly below the March rate but still better than any 1958 month, reports the Foundry Equipment Manufacturers' Association . . . The

National Electrical Manufacturers Association predicts 1959 retail deliveries of air conditioners of 1.6 million to 1.75 million units—18 to 30 per cent better than last year's . . . Reynolds Metals Co. is boosting primary aluminum output to 100 per cent of capacity (601,000 tons) . . . Sales of investment castings will increase 20 per cent this year, predicts Investment Casting Institute . . . Sales of factory-built homes will pass the 135,000 mark for a record this year, reports the Home Manufacturers Association.

## Who's Who in Atomic Submarine Building

America's first Polaris-firing submarine, the *George Washington* (pictured), slipped into the Thames River at Groton, Conn., last week. It's our first fleet ballistic missile sub and means we can soon deliver a nuclear payload to virtually any target in the Soviet Union in a matter of minutes—without relying on the co-operation of any other nation. The *George Washington* carries 16 Polaris "birds" with a range of 1725 miles. It sets a new high point in destructive force. The sub market is a growing one for metalworking (Page 94).

## You May Have to Finance a Strike Against Yourself

That's the implication of a Supreme Court decision made last week in a Ford Motor Co. test case. The decision allows collection of unemployment compensation by workers who must be laid off due to part shortages resulting from a strike in another state. Example: If the UAW struck GM's Central Foundry in Danville, Ill., causing shutdowns at many GM plants in other states, the idle workers could collect UC benefits.

## GE Gets Set for the Sixties

An array of new special machines will add more than 20 per cent to the capacity of General Electric Co.'s Large Steam Turbine-Generator Dept. at Schenectady, N. Y. (Page 92). They'll enable the department to turn out (annually) turbine-generator units with an output of 10 million kw (vs. 7.5 million before). Among the new equipment: A tape controlled milling machine (picture), a vertical stub-bar boring machine four stories tall.

## Battle of Ogden Dunes Rages On

It looks like National Steel Corp. will be delayed for at least several more weeks from breaking ground for a new plant at Ogden Dunes, Ind. Porter County, which wants heavy industry in the area, has overridden little Ogden Dunes's prohibitive zoning regulations, but the town is appealing the ruling. A hearing will be held in La Porte County (after a change of venue) on National Steel's case. Another hearing on Inland Steel Co.'s case (it, too, owns land in the area) will come up later. Complicating the already com-

plex situation: Portage Township (pro heavy industry) is trying to incorporate within Porter County, but another little community is trying to block the move. And Sen. Paul Douglas (D., Ill.), whose Chicago area constituents like to picnic and camp at Ogden Dunes, is pushing a bill to create a national park there. Prediction: National will build a plant there but only after much costly delay.

## SAE Looks at Foreign Competition, Cars of the Future

The Society of Automotive Engineers goes into session at Atlantic City, N. J., this week. It will hear about: Detroit's coming small cars going the economy-comfort route rather than the more austere European . . . eliminating spare tires to get extra trunk space . . . glass roofs . . . smaller engines and chemical fuels . . . simpler styling (Page 105).

## Canada's Steelmen Feel Imports Too

The 2 per cent cut in British steel prices (effective June 1) is toughening foreign competition in Canada. British wire products were selling below Canadian prices on both seaboards before the reduction. But Steel Co. of Canada Ltd. says its chief battle is with Belgian and German steel, which is undercutting even the British prices. "Heavy tonnages" of bars, angles, and rounds are going into Canada, reports L. T. Craig, Stelco's vice president of sales. The opening of the St. Lawrence Seaway has definitely accelerated imports, he says. Look for more interest in British steel among U. S. steel consumers—especially if a strike causes shortages (Page 183). Some 23,000 tons of foreign steel entered three U. S. ports (Chicago, Detroit, and Cleveland) during the last week in May. Milwaukee, Buffalo, and Toledo are getting tonnages too.

## Steel Strike Threat Brings Problems

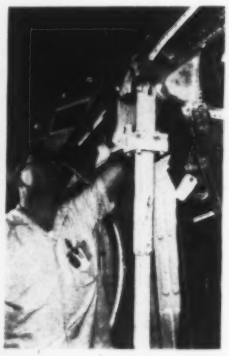
You can't expect steel mills to operate at capacity right up to the strike deadline. Nor can you expect capacity operations to resume for at least a couple weeks after a settlement. Steelmakers must start slowing down output in the next few days and plan to halt production completely on June 29 (more than a day before the strike deadline) unless a clear agreement is reached. Reason: Prevent damage to producing facilities (Page 90).

## 'Right to Work' Gets Reverse Twist

Look for labor to take the initiative in next year's fight over banning the union shop. Union leaders figure efforts to kill the right to work laws in several states will bring out a heavy labor vote for the Democrats. Republicans have given little indication that they'll try to get the laws adopted in states that don't have them. Unionists aren't as much interested in killing the laws as they are in getting a prolabor Congress—one that won't enact

sweeping reforms, the thing union chiefs fear most. It's another reason for you to get more active in politics.

## Shaped Materials Beat the Cost Crisis



Engineers at Rohr Aircraft Corp., Chula Vista, Calif., trimmed 20 per cent off the cost of making complex jet engine mounts by fabricating them from both standard and special shaped materials. Shown installed, the mount is made from six tailored forgings and pieces of bar and sheet stock. Other companies are finding that special shapes can cut manufacturing costs, sometimes trim material costs too. Check the factors on Page 142 that should influence your choice between standards and specials.

## New Packaging Innovation: Color on Corrugated Cartons

You can now put four to six color pictorial reproductions on your corrugated containers, thanks to a new process developed by Progress Lithographing Co., Cincinnati. The firm expects the idea to catch fire as a marketing technique with makers of appliances, toys, sporting goods, tools, garden equipment, building materials, auto parts, and other items.

## April Was Record Month for Manufacturing

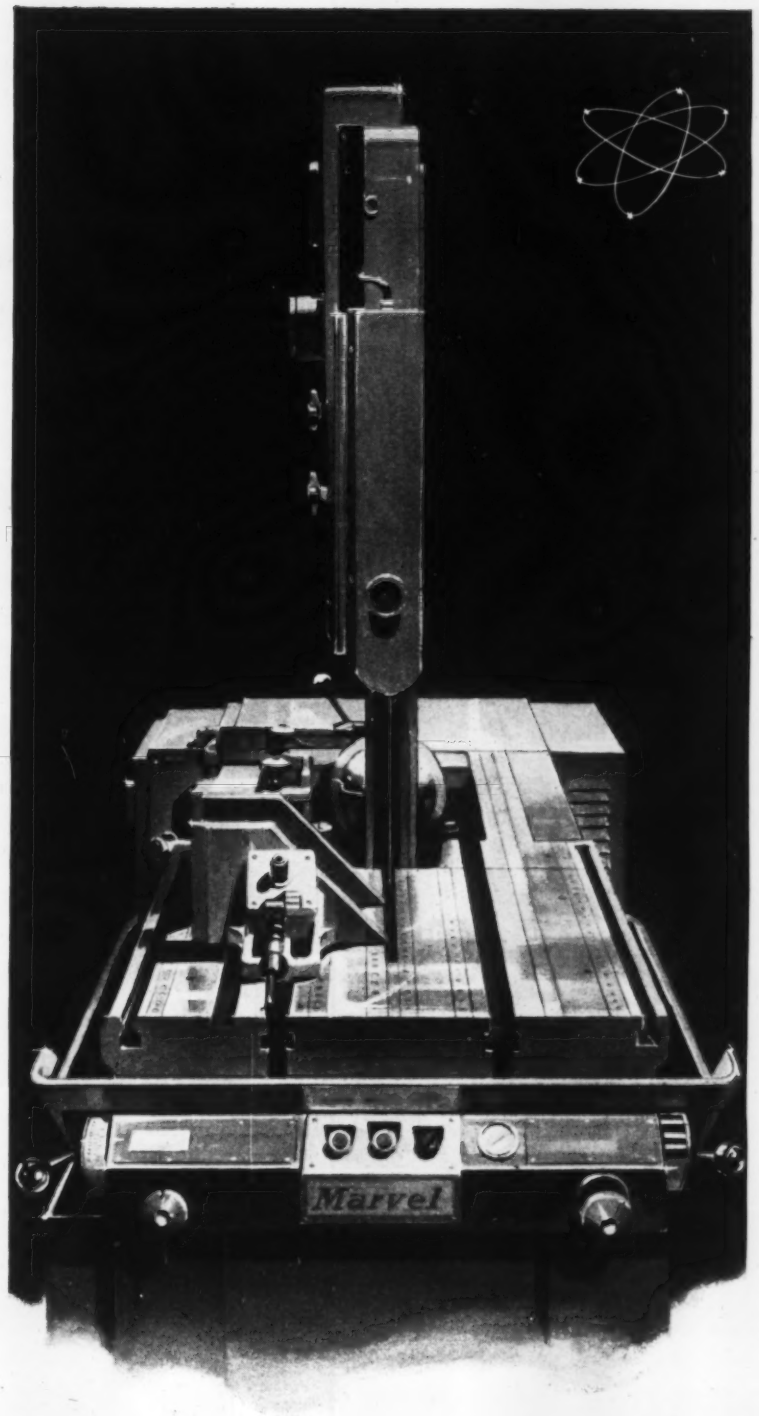
Manufacturers' shipments and new orders set records in April, reports the Department of Commerce. For the durable goods industries: Sales rose to $15.8 billion, up $3.9 billion from April, 1958; new orders hit $15.6 billion, up $4.7 billion; unfilled orders stood at $47.1 billion, up $3.1 billion.

## Steel-Hungry Nations Seek New Ore Sources

Expect the huge iron ore deposits in the wilds of Quebec and Labrador to get more attention. At least 24 companies are trying to find a way to wrest the ore from the rugged Precambrian shield. Their activities range from exploration to advanced technical planning. Some are investigating the economics of shipping ore from Ungava via Greenland to world markets (to overcome the problem of a short Arctic shipping season in Hudson Strait). Others are concentrating on areas closer to the St. Lawrence River and the 360 mile railway from Sept-Iles, Que., to Schefferville, about 700 miles northeast of Montreal. Canadian officials predict that by 1965 Canada's iron ore shipments will reach 53 million tons annually vs. 20.7 million in 1957.

## Straws in the Wind

Russia says it's building the world's largest blast furnace; it will produce 4500 to 5500 tons of pig iron a day . . . Renault is now the world's sixth largest producer of automobiles . . . Algoma Steel Corp. will build Canada's first wide flange beam mill; it's to be in production by late 1960 . . . Hertz Corp. may expand into the machinery rental business . . . Small business won $79.2 million worth of government contracts in April—$10.8 million more than in March . . . Use of aluminum foil combined with paper, film, and board will show a 50 per cent increase (to 150 million lb annually) over the next five years, says the Laminated Foil Manufacturer's Association.




*A goal we set many years ago has been reached.*

When MARVEL decided to produce a heavy duty production band sawing machine, we were determined to bring out the most advanced, the most efficient band saw that it would be possible to produce . . . regardless of the cost in research, invention, and truly "new" design.

We were not interested in producing a band saw that would be only "as good" or "equal", or even "similar" to other machines already on the market. The new MARVEL Band Saw would have to be a superior machine—years ahead in design and performance . . . and its design must solve problems that have constantly challenged band saw builders and users alike:

**Improve Band Sawing Accuracy . . . Extend Band Blade Life . . . and Reduce Cost Per Cut to the Minimum.**

The recent introduction of the MARVEL No. 81 Series Heavy Duty Universal Hydraulic Band Saw Machines, specifically designed for use with high speed steel band blades, and equipped with a MARVEL invention—the "Sure-Line" Automatic Blade Control*—is *THE* major technical development in metal band sawing during the 20th Century.

The MARVEL "Sure-Line" Automatic Blade Control is an electro-mechanical servo-mechanism that continuously senses and automatically corrects any tendency of a band blade to cut inaccurately. The "Sure-Line" unit literally "steers" the blade to make it cut in a straight line.

Because of this exclusive feature, MARVEL No. 81 Single Cut, and No. 81A Automatic Bar Feed Band saws are the only modern band sawing machines capable of fully utilizing all the advantages of high speed steel band blades. Heavier feed pressures and higher blade speeds can be safely applied with complete assurance that the accuracy of cut will not be impaired. This leads to much faster production.

For this—and many other reasons, the new MARVEL No. 81 Series Band Sawing Machines are literally *Tomorrow's Saws Today!* Why not write for full details now?

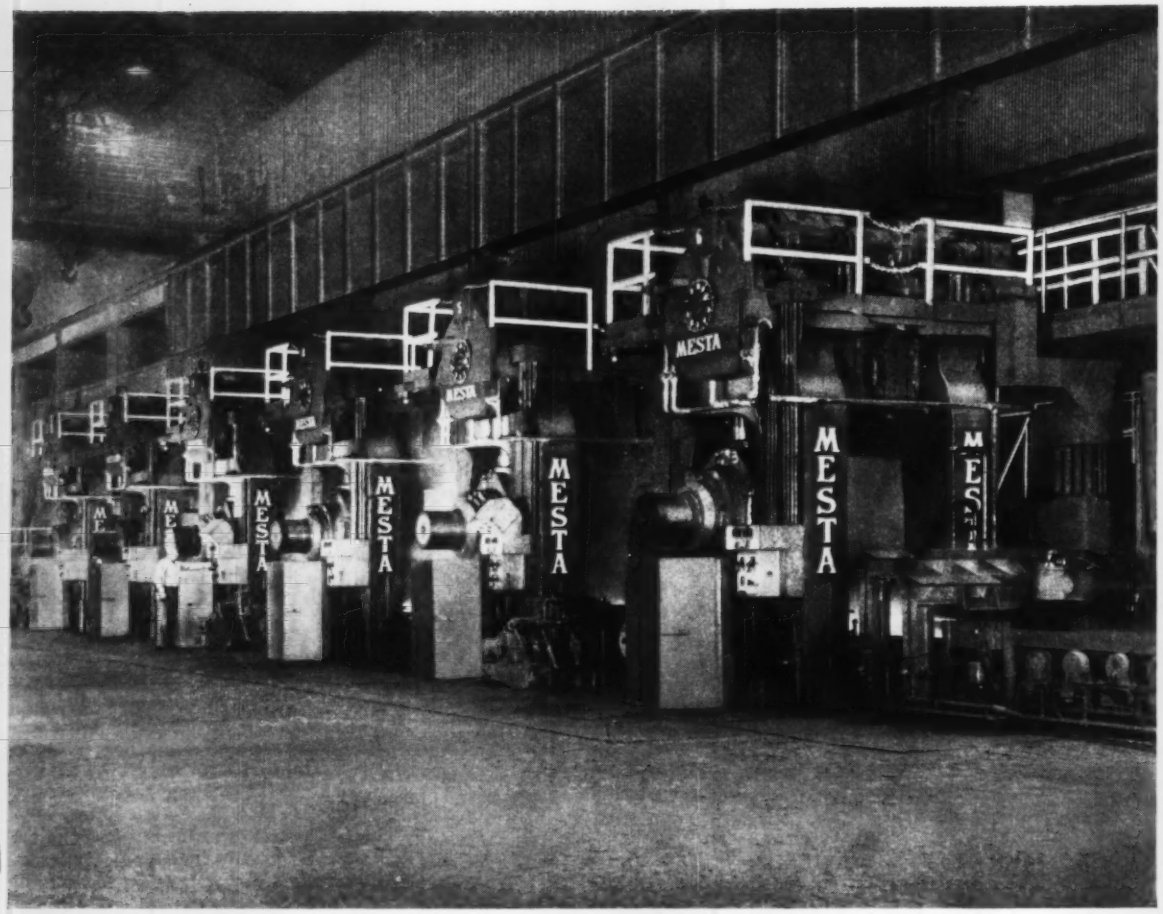
*BASIC PATENT APPLIED FOR

FROM MARVEL...

# TOMORROW'S SAW TODAY!

ARMSTRONG-BLUM MFG. CO. • 5700 W. BLOOMINGDALE AVE. • CHICAGO 39, ILL.

MARVEL Metal Cutting SAWS
Better Machines—Better Blades




Ni-Hard double-poured finishing rolls – 12 in all – are used in the 6 hot strip finishing stands at the Jones & Laughlin Steel Corporation, Aliquippa Works, Aliquippa, Penna.

# Jones & Laughlin equips hot strip mill with double-poured Ni-Hard working rolls

Finishing rolls of Ni-Hard* nickel-chromium cast iron help produce a lot of strip steel on the 44" Hot Strip Mill at the Jones & Laughlin Aliquippa Works. Twelve double-poured rolls are used, measuring 22½" dia., 44" across the face.

### Why Ni-Hard working rolls?

Ni-Hard cast iron possesses, because of its alloy content, a matrix structure similar to heat treated steel. Refined carbides are dispersed throughout this matrix. This is why Ni-Hard cast iron rolls possess considerably greater hardness, strength, and resistance to impact than rolls of unalloyed white cast iron. Abrasion resistance is several times greater.

Ni-Hard rolls have excellent resistance to spalling and fire cracking, too. This is because roll makers modify the Ni-Hard chemistry to produce fine flakes of free graphite which aid in the development of these properties.

### Casts much like grey iron

Ni-Hard castings are made with common foundry methods into rolls, ways, and other abrasion and wear resisting mill equipment.

For specific information on Ni-Hard alloy as applied to your abrasion problems, write Inco. For details on these double-poured Ni-Hard rolls, write Inco. *Registered trademark

**The International Nickel Company, Inc.**

67 Wall Street INCO New York 5, N.Y.

## NI-HARD

NICKEL MAKES CASTINGS PERFORM BETTER LONGER

# How to Meet Foreign Competition

In practically any conversation among businessmen, the subject inevitably swings to foreign competition.

The challenge is formidable (see "Meeting Foreign Competition," Page 131). European and Japanese plants rebuilt since the war are modern and highly efficient. Their products are being marketed aggressively, not only in their home countries in competition with American products but in practically every other Western country, including the U. S.

In Latin America and Africa, there is a strong resurgence of nationalism and an urge to industrialize.

The European Economic Community (Germany, France, Italy, the Netherlands, Belgium, and Luxembourg) will eventually be a free trading area with external tariffs.

Seven other nations (Britain, Norway, Sweden, Denmark, Austria, Switzerland, and Portugal) are planning a similar economic unit which may eventually join the EEC in mutually reducing trade barriers.

Next year, 40 nations (including the U. S.) adhering to the General Agreement on Tariffs and Trade will meet in Geneva to negotiate reciprocal trade agreements.

With the emphasis on freer trade in the Western orbit, it is practically futile for any American company to expect relief from the U. S. Tariff Commission.

As a matter of fact, a growing number of American companies are becoming convinced that freer foreign competition is a good thing.

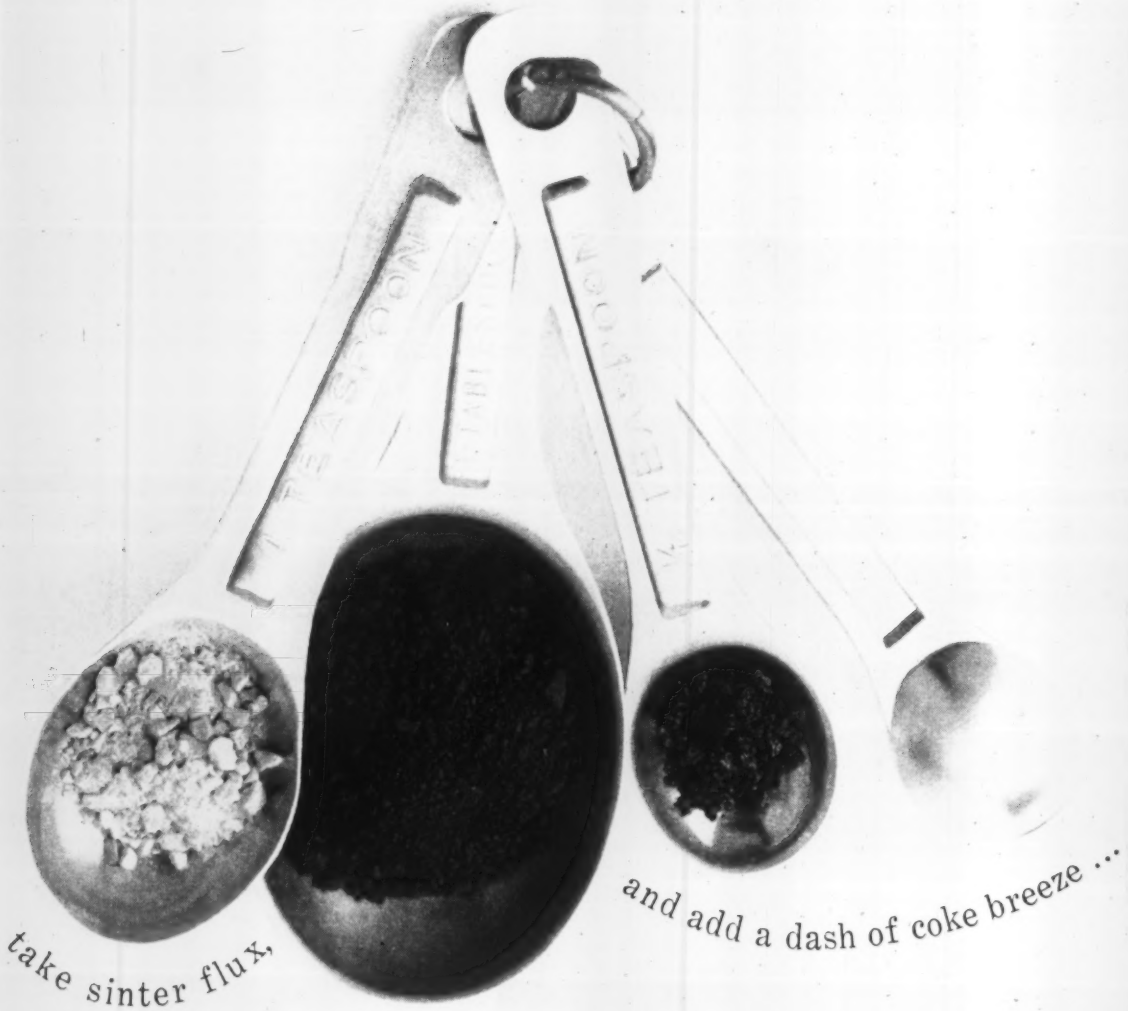
Abroad, they are serving their export markets through foreign-owned plants or licensees.

At home, they are attacking the problem through improved engineering, careful selection of materials, cost cutting production facilities, new and better products, and skillful marketing.

The problem of foreign competition will grow, not diminish, but it is not beyond solution. Faced squarely, it may not turn out to be the bugaboo many people believe it to be.

Irwin H. Such

EDITOR-IN-CHIEF



take sinter flux,

ore fines,

and add a dash of coke breeze ...

That's exactly what Inland's technical chefs will do when its giant, new sintering plant is completed in June. A single day's mix—4300 tons of iron ore particles, 500 tons of crushed limestone, 250 tons of fine coke—will bake a cake of clinkers which can be fed directly into blast furnaces. Result—better, faster reduction of raw iron ore to pig iron, blast furnace production upped 10%—*more and more Inland steel to feed the hungry production lines of fast-expanding Mid-America manufacturing!*

*Building Today with an Eye to Tomorrow*

**INLAND STEEL COMPANY**

30 West Monroe Street • Chicago 3, Illinois

Sales Offices: Chicago • Davenport • Detroit • Houston • Indianapolis
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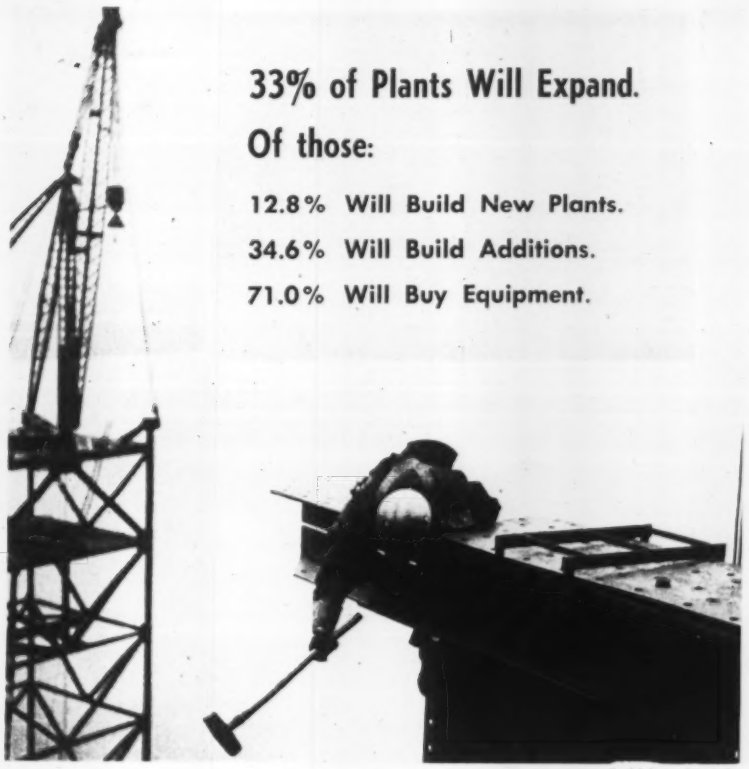
# Metalworking Capacity: Up 2.7% in 2nd Half




Bethlehem Steel Co.

ONE IN THREE metalworking plants will boost production capacity in the second half, STEEL found in a survey of 6000 plant managers.

It points up the optimism metalworking management has regained in the last six months. In a similar survey conducted last December, only 37.1 per cent of the plant managers said they would expand capacity during all of 1959.

Of those expanding capacity in the second half, 7 in 10 will buy equipment; 1 in 3 will build plant additions; 1 in 8 will build plants. Some of the new capacity is coming as a side benefit as metalworking buys new, more efficient equipment in its drive to lower unit production costs. Manufacturers of material handling equipment and semi-automated production machines will see their sales curves gain altitude.

• **No Boom Yet** — Metalworking will not see an expansion boom this year—but the managers' optimistic forecasts may signal the beginning of one. Metalworking hiked capacity only about 1.7 per cent during the second half of 1958, so the gain in the coming six months will be a full percentage point better than the year-earlier mark. But you have to go back only to 1957's second half to find a better six month period. Metalworking lifted capacity about 4.5 per cent then.

• **But Some Solid Groundwork**—The most significant capacity increase is the 3.9 per cent planned by the primary metal industries. Steelworkers expect their operating rate to drop to around 70 per cent in the third quarter if there is no strike. So why expand? Steel company managers are looking ahead to the 1960s. They foresee soaring sales curves. So do aluminum producers. Some think U. S. consumption of aluminum will reach 4.2 million tons annually by 1965 vs. 2 million to 2.3 million tons this year. Few foundries are expanding now; they already have quite a bit of idle capacity. But many are mechanizing lines to lower production costs.

• **Despite Problems**—One of the biggest deterrents to the purchase of new equipment is the nation's outmoded tax structure. In fact, the managers named inadequate depreciation allowances as the number five problem facing metalworking today (after price competition, inflation, pressure for wage increases, and tax reforms in general).

• **Who'll Expand Most**—Manufacturers of instruments and related products will hike capacity the most. Here's how major industry groups rank and how much each will boost capacity in the coming six months:

| | |
|---|---|
| Instruments, etc | 5.1% |
| Primary metals | 3.9% |
| Transportation equip. | 3.6% |
| Electrical machinery | 2.3% |
| Nonelectrical machinery | 2.3% |
| Fabricated metal products | 2.1% |
| Other metalworking | 3.0% |

• **Small Firms Optimistic**—Plants employing less than 500 will increase capacity 2.8 per cent; those employing 500 or more will hike it 2.1 per cent. More than 1 in 10 of the small firms will build new plants. One in three will build additions (vs. 1 in 4 for the larger plants). About 7 in 10 small plants will purchase equipment.

• **Who'll Buy Equipment**—Of the plants that will add capacity, here's how many will buy equipment:

| | |
|---|---|
| Primary metals | 84.6% |
| Instruments, etc. | 75.2% |
| Electrical machinery | 74.3% |
| Fab. metal products | 17.7% |
| Transportation equip. | 68.4% |
| Nonelectrical machinery | 60.5% |
| Other metalworking | 82.6% |

**For capital spending forecast, turn page**

# Plant & Equipment Spending Climbs Sharply

(Billions of dollars, seasonally adjusted at annual rates)

| | 1959 | | 1958 | |
|---|---|---|---|---|
| | July-Sept. | Apr.-June | July-Sept. | Apr.-June |
| Totals | **33.39** | **32.29** | 29.61 | 30.32 |
| Manufacturing | **12.82** | **11.95** | 10.86 | 11.53 |
| Durable goods | **6.31** | **5.75** | 5.16 | 5.57 |
| Primary iron & steel | **1.38** | **1.14** | 1.20 | 1.27 |
| Primary nonferrous metals | **0.34** | **0.37** | 0.35 | 0.44 |
| Electrical machinery & equip. | **0.52** | **0.50** | 0.43 | 0.47 |
| Machinery, except electrical | **1.01** | **0.88** | 0.84 | 0.96 |
| Motor vehicles & equipment | **0.70** | **0.61** | 0.52 | 0.63 |
| Transportation equip., except above | **0.42** | **0.37** | 0.35 | 0.36 |
| Mining | **0.97** | **1.02** | 0.88 | 0.92 |
| Railroads | **1.07** | **0.99** | 0.63 | 0.77 |
| Transportation, other than rail | **2.06** | **2.06** | 1.29 | 1.40 |
| Public utilities | **5.94** | **5.91** | 6.10 | 5.97 |
| Commercial & others* | **10.53** | **10.36** | 9.85 | 9.73 |

*Includes trade, service, finance, communication, and construction industries.

EXPECT U. S. businessmen to spend $32.5 billion for plants and equipment this year—nearly 7 per cent more than they did last year. That's the prediction of the Securities & Exchange Commission and the Department of Commerce.

It means capital spending will come within 12 per cent of the record $37 billion spent in 1957. SEC-Commerce predicts businessmen will invest in plant and equipment at an annual rate of $33.39 billion in the third quarter. The agencies peg the second quarter rate at $32.29 billion (vs. $30.62 billion in the first quarter and $29.97 billion in 1958's final quarter). The capital spending decline reached its low point (a $29.61 billion annual rate) in the third quarter of 1958.

• **Metalworking's Pace**—Producers of durable goods are expected to spend more than $6 billion this year—about $550 million more than they did last year. They'll account for half the increase for manufacturing industries.

Primary iron and steel producers will spend $1.281 billion in '59 (vs. $1.192 billion in '58 and $1.722 billion in '57). The primary nonferrous industries will spend only about half as much as they did in '57.

Electrical machinery makers will show a gain of about 10 per cent this year vs. last, and the nonelectrical machinery people will spend about $34 million more this year than last.

• **Rails Start Climb**—The nation's railroads, suffering seriously from lack of capital, will nevertheless spend $867 million this year—$113 million more than they did last year. But they'll be far from their $1.4 billion peak in 1957. It is reported that the rails will scrap more freight cars than they'll buy this year. And 1 in 10 freight cars reportedly will have to be repaired this year. SEC-Commerce predicts the rails will invest at an annual rate of $1.07 billion in '59's third quarter—nearly double the rate in 1958's last quarter (when they hit their recession low point).

• **The Growingest Group**—Keep your eye on the big category labeled "commercial and other" (see table) by SEC-Commerce. The trade, service, finance, communication, and construction industries appear to be on the threshold of a building boom. They're preparing for the big sales gains they'll get with the family formation increases that are coming in the 1960s.

THE MATERIAL HANDLING INSTITUTE, INC.
Welcomes You TO THE EXPOSITION WITH OVER 7 ACRES OF THE NEWEST IN HANDLING EQUIPMENT
June 9 thru 12

*Cost conscious, expansion minded crowd seeks . . .*

# Lift from Material Handling

SALES of material handling equipment will increase some 60 per cent in the next ten years, predicted W. A. Meddick, president of Elwell-Parker Electric Co., as the Material Handling Institute's 1959 Exposition got underway at Cleveland last week.

He expects industry sales this year to be 15 to 18 per cent over last year's. Equipment builders displaying their wares were in accord. Gilbert W. Chapman, president of Yale & Towne Mfg. Co., told STEEL that incoming orders for the first five months were about 50 per cent ahead of last year's. He predicts that his company will probably establish a sales record this year.

Evidence of increased interest in handling was shown by a record 30,000 registrants. Elmer F. Twyman, senior vice president of Yale & Towne, says that users are making up for what they didn't purchase in 1958.

**• Equipment builders have been preparing for expected sales increases through vigorous product development programs.**

The result of their planning was evident. Probably more new equipment was on display than at any previous show.

Clark Equipment Co. introduced a 50,000 lb capacity straddle carrier that will transport and stack 8 x 8 x 24 ft shipping containers. It can drive over a string of railroad flatcars to remove a container from a middle car. Loads other than containers—steel plates, ingots, bales—can be stacked 8 to 12 ft high.

Nearly all truck builders exhibited narrow aisle models. Many showed trucks that can operate in low headroom areas and still stack high in warehouses. New drive systems were in evidence too.

New shapes in fork trucks were also in evidence. Yale & Towne introduced a sideloading model which can stack higher than 14 ft in minimum width aisles. Automatic Transportation Co. showed a fork truck which can move in any direction with any shaped load.

Barrett-Cravens Co. had four of its operatorless Guide-O-Matic tractors in operation, their movements programed on magnetic tape from a programing panel.

Automatic conveying systems were in abundance in monorail types and chain, cable, wheel, roller, and belt models. Rapids-Standard Co. devoted much of its display space to its new pressure sensing wheel conveyor. Columbus McKinnon Chain Corp. emphasized its Power-Flex power and free conveyor equipped with Telematic dispatch control which automatically guides a carrier.

Those are only a few of the new products exhibited. In all, 237 exhibitors displayed products in 40 major classes of handling equipment.

**• The 1959 exposition may be the last national show sponsored by the Material Handling Institute. The association has announced a regional trade show program of at least four expositions for 1960 and '61.**

Prime reason for the change: To take the products to the markets, Robert F. Moody, chairman of the MHI expositions committee, told STEEL.

First of the regional shows will be in Commonwealth Armory, Boston, June 6-8, 1960. The Kentucky Fair & Exposition Center, Louisville, will house an exposition Nov. 8-10, 1960. A show will be held at the Cow Palace in San Francisco, Feb. 22-24, 1961. Philadelphia Convention Hall will be the scene of an exposition May 9-11, 1961. Mr. Moody said that MHI will not make any decision about a future national show until the results of the regional shows can be analyzed.

## Coke Ovens

**Last oven will be pushed 15 to 24 hours before strike deadline**

## Blast Furnaces

**Eight hours of work are required to bank them**

## Open Hearths

**Final heat must be charged more than 20 hours before deadline**

# Mill Shutdown May Start Within Days

STEELMAKERS must start slowing down output in the next few days and plan to halt production completely on June 29, more than a day before the strike deadline, unless a clear labor agreement makes it unnecessary to continue such a program to protect equipment and products. The precautionary measures must be initiated even though producers still hope to avert a general strike.

Pushing the last of the coke ovens, banking blast furnaces, and tapping final open hearth heats are the jobs to be done before a walkout, if it comes. Producers will be closing down processing lines day by day, moving out the specially finished products which would spoil in a long shutdown.

**• Stopping coal supplies is an early chore in the winding up process.**

Mines must be notified to halt shipments two to seven days before deadline, depending on mine-mill distance. Steelmakers will have to call their halts well in advance of the miners' annual holiday starting June 26.

**• Timing the last open hearth heat is the critical shutdown factor.**

The final heat will be charged into the open hearths more than 20 hours before strike deadline. In that time, the heat will be tapped, poured, and stripped of the ingot molds. Soaking pits, blooming mills, and slabbing mills can operate until the final hour. Ingots will be left in the pits to cool until operations are resumed.

If there's a strike, silica roof furnaces will be shut down and allowed to cool for the duration. Basic open hearths, however, must be fired with natural gas and maintained at about 1000° F. All metal has to be removed from the open hearths to keep it from "freezing" in the furnaces.

**• Banking of coke ovens and blast furnaces will depend on open hearth schedules.**

The last coke oven will be pushed some 15 to 24 hours ahead of shutdown; if some ovens are given a partial charge to maintain gas supplies and prevent damage to silica linings, they will be slowed to about 1800° F and the coking cycle stretched to 40 or 50 hours instead of the normal 15 to 18 hours. When ovens have been emptied, gas lines will have to be purged and coal chemical units cleaned of benzene, toluene, and other products.

**• Banking blast furnace units takes 8 hours.**

Some 10 hours before a furnace's last cast is tapped, a bank burden of coke and blanket of "wet ore" from 4 to 6 ft thick will be charged into the unit. This cap seals off the upward draft in the furnace. When the final cast is out, tuyeres are removed from the furnace and their openings plugged with clay, backed by sand. The openings are then bricked up to prevent combustion in the sealed furnace.

**End of Line**

**Ingot molds are stripped 4 to 6 hours after pouring**

made. The first steelmaking is a touch and go process of adjustments which may go on for a week.

Why is starting up dangerous? An operations manager explains: Open hearth roofs may collapse suddenly; a blast furnace "breakout" may occur where hot metal meets water or cooling fixtures; metal may explode if it hits moisture in a ladle.

Supervisors keep careful head counts of their crews so accidents will be discovered quickly.

In all, repairs to equipment and starting production will take two weeks or more. In 1952, the industry attained 42 per cent of capacity production in the first week after the 58 day strike ended. In the second week, production was up almost to a 90 per cent rate; the last 10 per cent is the hardest to get, steelmakers say.

Finally, the furnace bosh is spray coated with a fireclay or water glass mixture, sealing air off from the cooling, contracting brick. The operator may also force steam into the top of the furnace to form a back pressure above the ore cap.

During a walkout, standby employees are needed to maintain gas supplies to ovens and open hearths, and water supplies for cooling systems and plant fire hydrants.

**• When operations are resumed, returning crews face a laborious and dangerous job.**

Coke ovens will be ready for charging about 4 hours after they are fired; the first push will be made about 24 hours later.

Unsealing and rebricking blast furnaces may require 16 to 24 hours. Then, air can be introduced and hot blast stoves started. Another 16 to 20 hours will elapse before slag is molten and flowing to heal breaks in the furnace. Then 12 hours more will elapse before hot metal will be ready for the open hearths.

Initial open hearth heats are started with high quality scrap. The charge must be heated about 24 hours before the first tap can be

# Will Ike Enter Steel Talks?

NOT DIRECTLY—now.

Until June 30, look for the President to confine any direct action about the steel labor situation to press conference appeals for "statesmanship" by both sides. Behind the scenes, he and his staff will try to persuade management and labor to settle.

**• But odds are that even the Presidential prestige will not bring a peaceful settlement of the steel dispute.**

President Eisenhower will increase his behind-the-scenes pressure for a steel pact as the expected strike progresses. If the walkout lasts six weeks, he'll consider asking for the 80-day cooling off period provided for in the Taft-Hartley Act.

Intervention may come from other branches of government, too. Nine Senate Democrats have invited United Steelworker President David McDonald to give them a report on the negotiations today (June 15). U. S. Steel Corp.'s chairman, Roger Blough, will report to them next Monday, June 22.

**• The steel companies want to avoid government intervention, and the union isn't keen about it either.**

It's about the only point both sides agree upon currently. And fear of more direct U. S. action is the most potent force for peace in steel labor.

**• The two sides are still far apart but may be getting closer.**

Last week the union presented a long list of proposals, but no money cost on any of them and was vague on many. Industry's estimates of the expense of the demands range from 75 cents to $1.60 an hour.

The industry for the first time indicated it would change its extend-the-contract stand if the USW would accept an eight-point program to allow steelmakers to be more efficient.

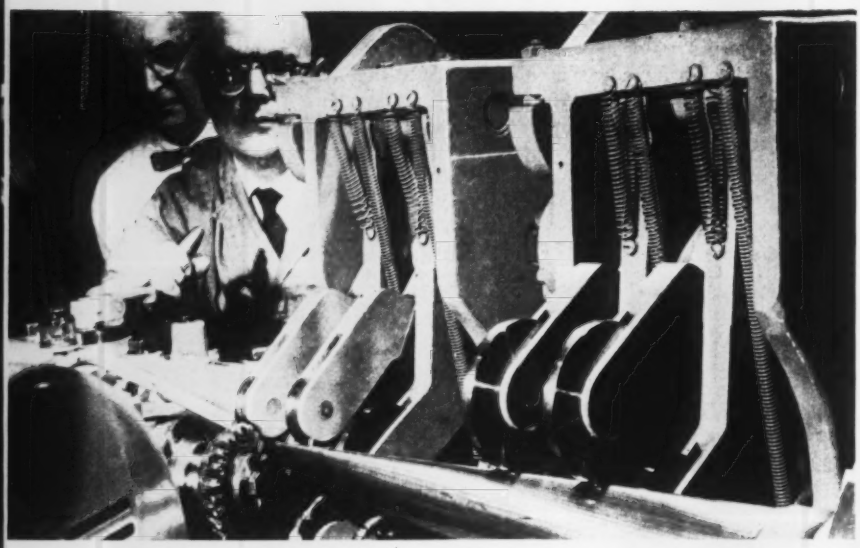
The 12 individual teams from the big steel companies in the wage case will reassemble in New York tomorrow to try to get negotiations off dead center. Some people last week were deducing from this development that a selective strike is more likely. Analysis: Still possible, but not probable.

Both sides continue to take their cases to the public to a degree never before practiced. It disturbs some government officials. Labor Secretary James Mitchell called on the negotiators to quit haggling publicly.

## April Strike Toll Rises

National strike activity followed a rising seasonal pattern in April, with 350 new strikes taking out 175,000 workers. A carryover of 125 stoppages from March raised the total April strike idleness to 2.5 million mandays.

Strikes in the first four months of this year have totaled 1025, an increase over 1958 but below levels in other postwar years. More workers were involved in stoppages during the 1959 period than in any of the three previous years. Total strike time in this period, including that of several large stoppages which have continued from 1958, mounted to 7 million mandays, or about one-fifth of 1 per cent of all working time.



**Turbine buckets up to 72 in. long** can be profiled on the above tape controlled milling machine. Built at Ex-Cell-O Corp., Detroit, it is one of four. The machines, worth about $1 million, give the designer more freedom because nearly any shape can be profiled. They will also cut manufacturing leadtime and result in more efficient turbines, say GE officials

**A unique application of automation to a job shop,** the machine (below) does 250 operations on generator conductor bars, which average 19 ft in length. Built by Simmons Co., Albany, N. Y., the machine has six heads, each guided by punched cards. The heads move in turn down the length of the bar. Operations include wire brushing, inserting and welding passage plugs in place, machining ports and tapers, and deribbing. The machine's ways are 90 ft long

# GE Bets Millions On Power Boom

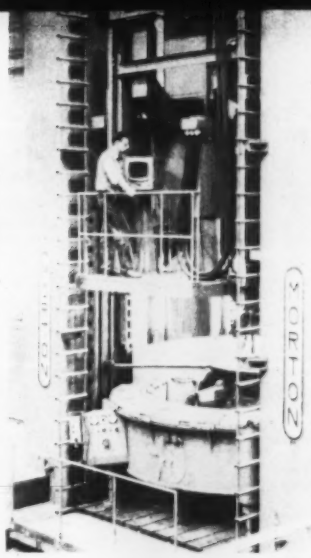
**That's the amount of money management has invested in 19 new machine tools for the company's Large Steam Turbine-Generator Dept. Five are numerically controlled**

AN array of newly installed special machine tools has added more than 20 per cent to the capacity of General Electric's Large Steam Turbine-Generator Dept. at Schenectady.

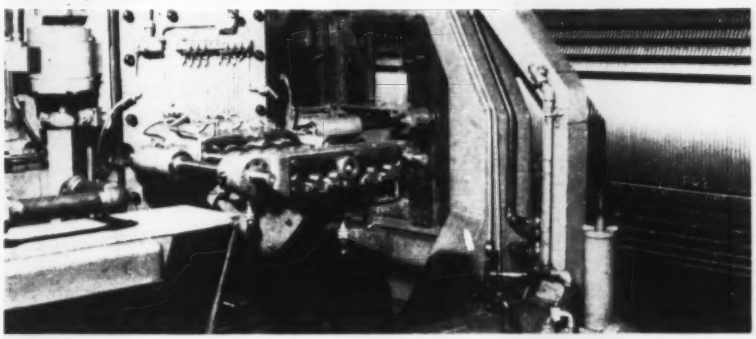
Discussing the machines at a press conference last Thursday, Herman R. Hill Jr. said the department can now turn out (annually) turbine-generator units with an output totaling 10 million kw. Mr. Hill, the department's manager of manufacturing, pegged the previous peak at about 7.5 million kw.

The new machines, most of them tailored to GE's requirements, are part of a continuing expansion program. Mr. Hill estimates that in the next ten years, "we'll have to produce as much as 16 million kw worth of units in a year."

W. W. Kuyper, the department's manager of manufacturing engineering, (see Page 155) says that all the machines represent a joint effort in conception and design between General Electric and the machinery builders. As a reward: "We are getting our congratulations (in the form of) more efficient operations."

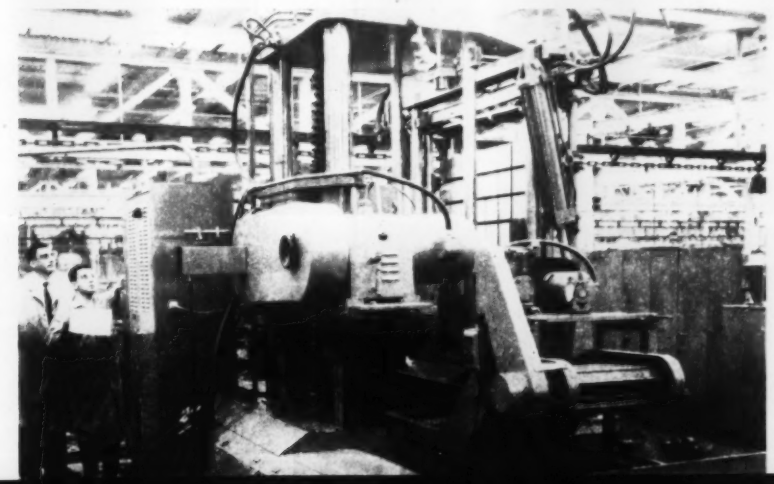


**Tall as a four-story building,** the vertical stub-bar boring machine (at right) works on 20 ton turbine shells. The operator rides on an elevator —watches the tool in the cut through a closed-circuit television hookup. The machine, built by Morton Mfg. Co., Muskegon Heights, Mich., cost more than $1 million. It uses numerical control to establish both the vertical and radial positions of the tool



**This 28 ft long drilling machine,** guided by tape, will drill and ream more than 2700 holes in generator rotors that weigh as much as 90 tons. Built by Baker Bros. Inc., Toledo, Ohio, the machine (above) has a four-faced turret, each face having a removable head with five spindles. The machine can drill one hole at a time, or five at a time; it can be set up for tapping or for tangential milling. The machine, costing about $500,000 to build and install, handles the work formerly done on conventional radials and horizontal boring mills

**Drilling holes in plates as thin as ⅜ in.,** or stacked as thick as 10 in., the numerically controlled machine (below), built by Walter P. Hill Inc., Detroit, will put up to 2000 holes in each piece. In addition to drilling, the machine, as directed by punched tape, also reams and chamfers. Drilling speed is 8 to 10 in. a minute. Chips are taken out by a conveyor. The machine is 15½ ft long



# Study Radioactivity Use in Steelmaking

RADIOACTIVITY'S use in steelmaking is being surveyed by Nuclear Science & Engineering Corp., Pittsburgh.

It will work under a one year contract awarded by the American Iron & Steel Institute.

The project will include studies with such firms as U. S. Steel Corp., Jones & Laughlin Steel Corp., Youngstown Sheet & Tube Co., National Steel Corp., and Crucible Steel Co. of America. Senior staff members of NSEC will visit the companies to find out where new or improved methods may be needed.

They'll discuss the use of radioisotopes and nuclear techniques in production or quality control, automation, inventory control, pilot plants, and development operations.

• **Possible Uses**—Operations to be studied may include: 1. Thickness and height gaging for solids and liquids. 2. Rolling speed control. 3. Control of melt heats. 4. Bar or ingot identification. 5. Scrap identification or analysis. 6. Raw material analysis. 7. Control of pickling baths with respect to impurities or activity. 8. Control of coating or plating thicknesses. 9. Industrial waste disposal problems. 10. Rapid procedures for melt analysis during heat processes. 11. Detection and characterization of imperfections on internal surfaces of tubes. 12. Instrumentation for process automation in the above areas.

Other problems in the development of new or improved products which may be investigated are these two:

Identification and distribution of inclusions and their sources of non-segregated impurities and their sources, and the recovery of raw materials from industrial wastes.

The AISI contract is one of the first to be awarded by private industry for the study of industrial uses of radioactivity. Prior studies have been sponsored mainly by the Atomic Energy Commission through its program for development of isotopes.

# Who's Who in Nuclear Submarines

## In Commission

| Name and Type | Length | Displacement | Commission Date & Builder |
|---|---|---|---|
| **Nautilus—Attack** | 320 ft | 3180 tons | 1954—General Dynamics Corp. |
| **Seawolf—Attack** | 330 ft | 3260 tons | 1957—General Dynamics |
| **Skate—Attack** | 268 ft | 2360 tons | 1957—General Dynamics |
| **Swordfish—Attack** | 268 ft | 2360 tons | 1958—Portsmouth, N. H. (Navy) |
| **Sargo—Attack** | 268 ft | 2360 tons | 1958—Mare Island, Calif. (Navy) |
| **Skipjack—Attack** | 252 ft | 2830 tons | 1959—General Dynamics |

## Launched

| | | | |
|---|---|---|---|
| **Seadragon—Attack** | 268 ft | 2360 tons | 1959—Portsmouth (Navy) |
| **Triton—Radar Picket** | 447 ft | 5900 tons | 1959—General Dynamics |
| **Halibut—Guided Missile** | 350 ft | 3555 tons | 1959—Mare Island (Navy) |
| **George Washington—Fleet Ballistic Missile** | 380 ft | 5600 tons | 1960—General Dynamics |

## Under Construction

| | | | |
|---|---|---|---|
| **Scamp—Attack** | 252 ft | 2830 tons | 1960—Mare Island (Navy) |
| **Scorpion—Attack** | 252 ft | 2830 tons | 1960—General Dynamics |
| **Sculpin—Attack** | 252 ft | 2830 tons | 1960—Ingalls Shipbuilding Corp. |
| **Shark—Attack** | 252 ft | 2830 tons | 1960—Newport News Shipbuilding & Drydock Co. |
| **Snook—Attack** | 252 ft | 2830 tons | 1960—Ingalls |
| **Thresher—Attack** | 252 ft | 2830 tons | 1960—Portsmouth (Navy) |
| **Permit—Guided Missile** | 278 ft | 3747 tons | 1960—Mare Island (Navy) |
| **Pollack—Guided Missile** | 278 ft | 3747 tons | 1960—Ingalls |
| **Plunger—Guided Missile** | 278 ft | 3747 tons | 1960—Ingalls |
| **Tullibee—Hunter-Killer** | 260 ft | 2175 tons | 1960—General Dynamics |
| **Patrick Henry—Fleet Ballistic Missile** | 380 ft | 5600 tons | 1960—General Dynamics |
| **Theodore Roosevelt—Fleet Ballistic Missile** | 380 ft | 5600 tons | 1960—Mare Island (Navy) |
| **Robert E. Lee—Fleet Ballistic Missile** | 380 ft | 5600 tons | 1960—Newport News |
| **Abraham Lincoln—Fleet Ballistic Missile** | 380 ft | 5600 tons | 1960—Portsmouth (Navy) |

## Contracts Awarded

| | | | |
|---|---|---|---|
| **Barb—Attack** | 252 ft | 2830 tons | not set—N.Y. Shipbuilding Corp. |
| **Haddo—Attack** | 252 ft | 2830 tons | not set—N.Y. Shipbuilding |
| **Jack—Attack** | 252 ft | 2830 tons | not set—Portsmouth (Navy) |
| **Tinosa—Attack** | 252 ft | 2830 tons | not set—Portsmouth (Navy) |
| **Dace—Attack** | 252 ft | 2830 tons | not set—Mare Island (Navy) |
| **Ethan Allen—Fleet Ballistic Missile** | 380 ft | 5600 tons | not set—General Dynamics |

## Authorized

| | |
|---|---|
| **SSB 609—Fleet Ballistic Missile** | Contract Not Awarded |
| **SSB 610—Fleet Ballistic Missile** | Contract Not Awarded |
| **SSB 611—Fleet Ballistic Missile** | Contract Not Awarded |

Sources: U. S. Navy, Electric Boat Div. of General Dynamics Corp.

# Program

USS GEORGE WASHINGTON, America's first Polaris-firing submarine, slipped down the ways into the Thames River at Groton, Conn., last week.

It's our first fleet ballistic missile submarine and means America can soon deliver a nuclear payload to virtually any target in the Soviet Union in a matter of minutes.

Our mushrooming nuclear sub fleet now breaks down like this: Ten have been launched. Six are in commission. Three more will be commissioned this year, and 15 will go into commission next year (see list on Page 94).

• **Fire Power**—The *George Washington* will carry 16 Polaris "birds" with a range of 1500 nautical miles (1725 land miles). Each is armed with a thermonuclear warhead. They give the *George Washington* destructive power equal to all the bombs dropped by U. S. planes in World War II. Putting it another way, its capacity for destruction is greater than the total firepower of the U. S. Navy between the Revolution and World War II, says General Dynamics Corp., whose Electric Boat Div. built the *Washington*.

• **Vital Statistics**—It's 80 ft longer than a 100 yd football field, 32 ft wide, and has a displacement of 5600 tons. It ranks only behind the *Triton* (STEEL, Aug. 25, 1958, p. 50), as the largest unit in our nuclear sub fleet.

Construction required 2260 long tons of steel, and thousands of pounds of aluminum, copper alloys, lead, and other metals. It required 70 miles of cable, 24 miles of pipe, 118 electric motors, 67 tons of weld metal, and 3300 separate plans. General Dynamics issued 40,000 purchase orders to subcontractors and sent 340,000 material requisitions to the Electric Boat Div. storehouse. Its cost will approach $100 million.

• **Firsts**—The *George Washington* will manufacture its own oxygen with an electrolytic generator.

It will be the first submarine to have three separate navigational systems and special stabilizing equipment. One indication of its complexity: More than 100,000 electric connections are found in the missile control center alone.

The *George Washington* will also be the first vessel to have two complete crews. They'll rotate about every three months. Purpose: To keep the ballistic missile subs constantly at sea, poised for action.

# Plot Your Productivity Gains

YEAR-BY-YEAR productivity gains are plotted in advance, like plant improvements and new facilities, at Westinghouse Electric Corp. You can use the technique to chart your way into a growth position in the sixties. Here are some tips which were given before the American Society of Mechanical Engineers by George W. Jernstedt, manager of Westinghouse's headquarters manufacturing planning.

Westinghouse believes the average industrial manufacturing plant must have a 3 to 5 per cent productivity increase annually to hold its own. This means: With inflation driving up employment and material costs, the successful organization will have to do better than 5 per cent.

A twofold program for increasing productivity and physical growth is based on these guides: 1. Planning assumes that the output of a plant can be increased 3 per cent per year with continual planning and normal improvements in equipment and use of materials. 2. Improvement in productivity above 3 per cent must be obtained by major changes in product, or method, or facilities, or a combination.

**• Raising manufacturing productivity is the job of three different functional groups: The line group, control group, and planning department.**

The line organization is charged with maintaining employee efficiency at a reasonable level and applying an organized effort to improve the indirect, or managed cost, area.

Westinghouse believes that increasing gains in productivity will come from the indirect cost area.

Mr. Jernstedt says: "We place indirect labor under managed costs. In the past, when activity increased, these costs would rise. But as the volume decreased, these costs did not come down proportionately. One of the steps taken by many Westinghouse divisions was to establish a standard volume—the smallest forecast of annual volume expected during the next three years. All activities of an expense nature are geared to the standard volume level and are not affected by normal fluctuations of volume.

**• The control group is responsible for the control of inventories and for scheduling of the flow of materials.**

The control function improves production and control systems, reduces and consolidates paperwork into data processing centers.

**• A permanent manufacturing planning department is at work in every division.**

The planning organization provides the professional personnel to continually develop new and improved methods and facilities. "New plant planning probably best explains how the planning function operates. A parallel planning team is separated from an activity presently producing the product. This planning team does not concern itself with the day-to-day job of planning operations; it devotes full time to the job of planning the new plant. These planning teams are assigned three to four years in advance of the time we expect a major new plant to start operations. Where the planning team has been particularly aggressive and imaginative in establishing new methods in the new plant, we have secured improvements in productivity of 20 per cent," explains Mr. Jernstedt.

He believes: "It is not necessary to build a new plant to increase productivity. It is necessary to have a permanent organization devoting full time to initiating projects of scope to do an effective job."

*Rep. Wilbur Mills credited for good timing as . . .*

# Tax Reform Plan Gets Push

CIRCUMSTANCES favor some form of tax relief next year.

First, you can see an indication of intent in the scheduling of hearings by the House Ways & Means Committee (it originates all tax legislation). Credit Rep. Wilbur Mills (D., Ark.), chairman of the committee, with a superb sense of timing. Hearings start Nov. 2, about a year to the day before we go to the polls in 1960. They will probably last until Congress reconvenes in January, 1960. Tax reform legislation could become the major campaign issue that spring.

Second, a slight surplus in the federal budget for fiscal 1960 (which opportunely ends June 30, 1960) could bloom into a substantial surplus as personal income and corporate profits rise. Nothing could be better calculated to give Congress the chance to cut taxes.

Third, the House passed only a one year extension of the 5 per cent (Korean) tax rate. You can assume that Representative Mills used his great influence to keep the extension down to one year. It was reported that some other Democratic leaders wanted a two year extension to avoid a corporate tax hassle in an election year.

## Objectives of the Tax Hearings

The Ways & Means Committee has divided its hearings into four major areas: 1. A general appraisal of the tax system to select proper objectives of reform. 2. A study of the size and characteristics of individual and corporate tax bases. 3. Features of the system which have been installed for special reasons and which may now need to be re-evaluated. 4. An analysis of the income tax rate structure.

Business expense deductions will be looked at carefully, the committee promises. They include depreciation, depletion (and exploitation and development costs), research and development costs, and entertainment expenses. The tax treatment of retirement plans and stock options will also be investigated.

## Here Is Metalworking's Opportunity

Chairman Mills emphasizes the hearings are the first phase of the committee's study: "The hearings are exploratory in character and are intended to determine the practical possibilities of establishing a broader income tax base and lower rates. No legislative program will be undertaken by the committee until interested persons have been afforded the opportunity to express their views."

The committee will attempt to work with as few preconceptions as possible. Panels of tax experts from all phases of the economy will participate, and it wants to hear what you want done about taxes.

As in the case of depreciation last year, Congress has opened the door, giving metalworkers an opportunity to get some constructive help. The lessons learned then still pertain: Industry probably failed to get depreciation reforms because it was apathetic and because it did not present a united front. It couldn't even agree on what it wanted (STEEL, Mar. 2, p. 69).

## Renegotiation Appeals Stalled?

The House's four year extension of the Renegotiation Act contained a little help for metalworking. It provided for a U. S. Court of Appeals review of U. S. Tax Court decisions on renegotiation cases. But it looks as if the Senate will kill this feature. It did last year when the act was extended for one year. Thomas Coggeshall, Renegotiation Board chairman, withdrew his endorsement of the appeals amendment following testimony before the Senate Finance Committee. It was stated that the tax court is carrying too big a case load now. If cases could go on to the Court of Appeals, more cases would be filed with the tax court, said a spokesman for the tax court.

Charles Stewart, Machinery & Allied Products Institute, expressed the fears of all businessmen that the four year extension is a "long step" toward making renegotiation permanent.

## 'Lobby' Talk Must Be Watched

Metalworking, particularly defense contractors, must tread lightly in its attempts to gain tax reforms, warn Washington observers. Talk of a "munitions lobby" did much to kill renegotiation reform. When depreciation tax reform comes up for discussion in Congress next year, you can expect plenty of finger pointing.

Jet brake cup — LS-53
Synthetic lube diaphragm — LS-53
Diesel equipment seal — Viton
Drop-off tank seal — LS-53
Chemical pump liner — Viton
Natural gas valve diaphragm — Viton

# For advanced fuel...hydraulic...lube systems,

## New materials prove ideal in handling temperature extremes −350° F. to +750° F.

Working with two remarkably versatile elastomers, C/R Sirvene engineers are producing flexible molded parts for many vital fuel, lubricating, hydraulic and pneumatic systems. One, Viton-A*, can be compounded to produce parts that function dependably at 600° F., and for short periods up to 750° F. The other important feature of Viton compounds is their excellent resistance to corrosive chemicals, chlorinated solvents as well as both synthetic and petroleum base fuels and lubes. At the other extreme, C/R compounded Silastic LS-53** parts are providing low temperature operation down to -80° F. They also exhibit excellent resistance to synthetic and petroleum base fluids up to 350° F., and function well in propane up to 500° F. For temperatures as low as -350° F., C/R recommends Teflon* compounds.

C/R Sirvene engineers have an intimate knowledge of these elastomers. They also have perfected special techniques in processing which still further improve the physical properties of the molded parts. If your problem involves high or low temperatures, close tolerances, and compatibility in advanced design fuel, lubricant or hydraulic systems, get in touch with us at once. We have the skill and the facilities to help you.

* DuPont registered trademark
**Dow-Corning registered trademark

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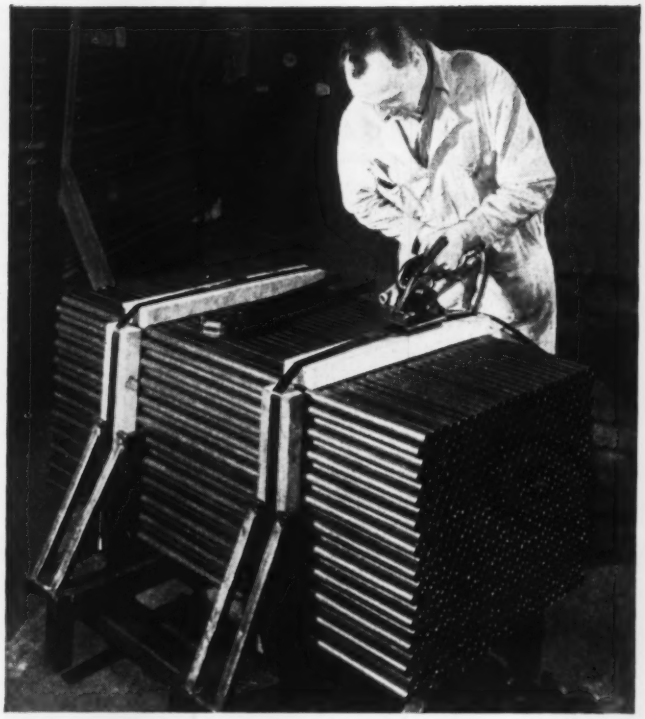
C/R

# Fast new Signode heavy-duty tool

*at least*
**Saves this much strapping**

**every time it's used**

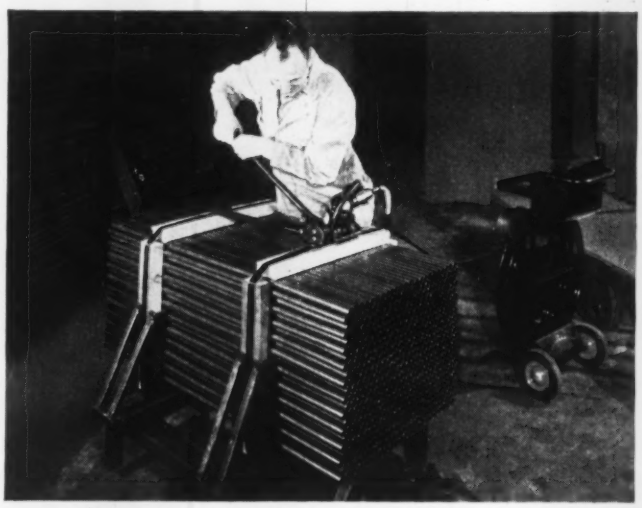


Air power tensions 1¼" strapping fast, pulls as much as 3000 pounds of pre-set tension every time. Feed wheel permits unlimited take-up of slack.

The FN-114 is the first air power feed wheel heavy-duty tensioning tool. It is fast and easy to use. In addition to saving time, it eliminates waste in the curl of strap which, until now, has been a necessary evil in applying 1¼-inch strapping with windlass type tools.

Additional savings come from the fact that the FN-114 takes strapping directly from the dispenser—takes out all the slack *before* the strapping is cut off by a quick stroke of the handle.

The FN-114—like other Signode heavy-duty tools—is available on an annual rental or single payment basis. Let us arrange a demonstration on your premises at your convenience. Just write or call. No obligation.



The powerful FN-114 holds the tension in the strapping while the operator applies the seal, using a Signode Model C tool. Signode heavy duty air-powered sealers are also available.

New 1¼" seal has open flange to permit fast, easy placement. This seal or regular thread-on seal can be lithographed with your company name, trademark, and colors.

*First in steel strapping*

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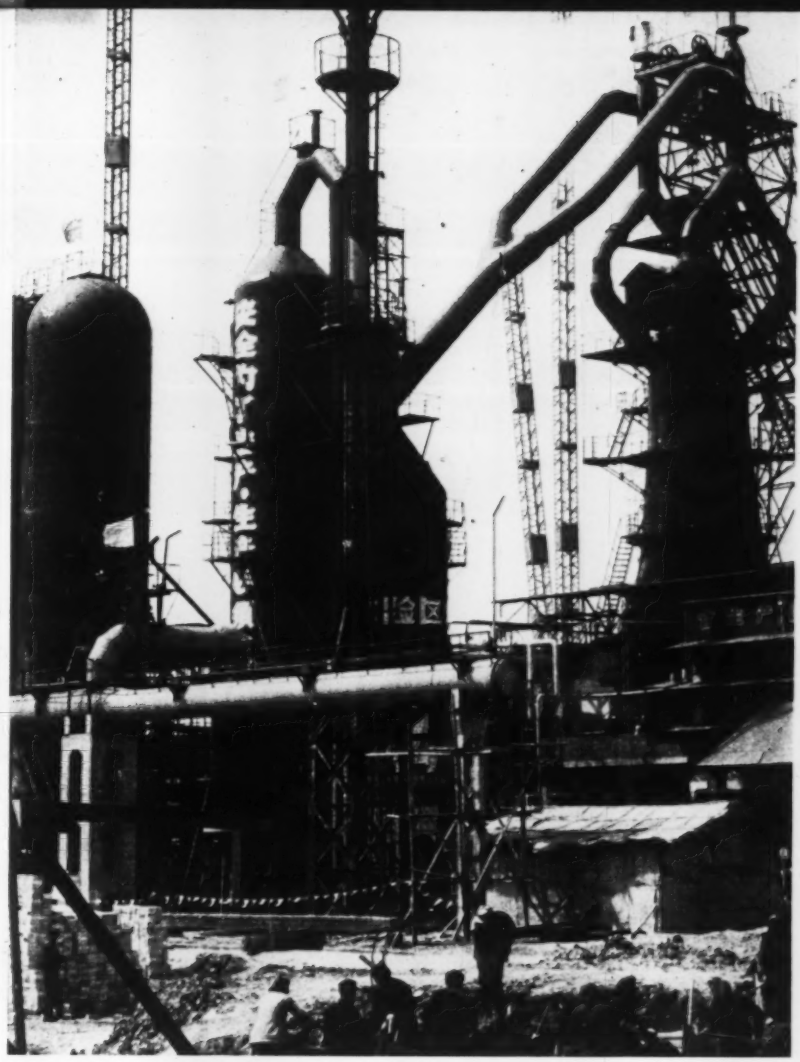


Shanghai's first blast furnace

# Steel Boom in China: It's Ominous

RED CHINA is moving menacingly up the industrial ladder. Capital goods production is expected to spiral 46 per cent this year. Output of consumer goods is expected to increase 34 per cent. "Production of several hundred million tons of steel within ten years is not impossible," says Hsueh Pao-ting, top economic planner.

• **China's leaders admit the 1959 goal of 18 million tons of steel is far short of its needs for 600 million population.**

But they claim last year's successes (see Page 102) prove they can advance rapidly. Po I-po, National Economic Commission head, looks at "objective possibilities": "Eighteen key iron and steel enterprises will increase capacity to about 16 million tons. Additions to present works and construction of 24 medium sized steel mills will add 6 million more tons. There are also many small steelmaking furnaces."

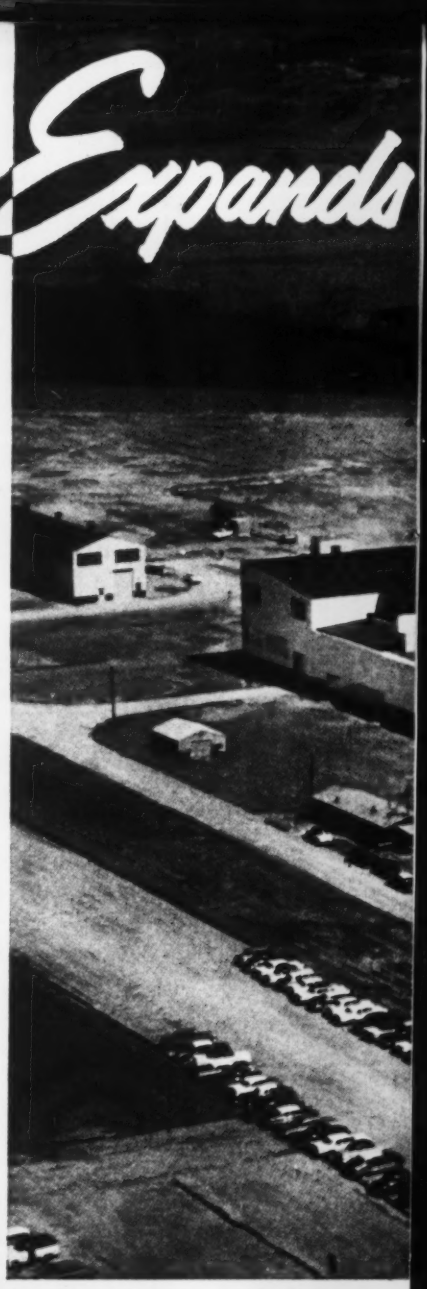
• **Major weakness of China's mushrooming industry: It's big in the middle but small at both ends.**

Smelting expanded spectacularly last year, outstripping steel rolling capacity and ore, coke, and refractory production. The Reds hope to

(*Please turn to Page* 102)

# UNIVERSAL-CYCLOPS STEEL *Expands*

## . . . with a New Plant and New Cold Finishing Facilities at Coshocton, Ohio



Universal-Cyclops, one of the leading producers of cold rolled stainless steel strip, announces the opening of a new plant at Coshocton, Ohio, which will supplement our facilities at Bridgeville, Pa., and greatly augment production capacity to meet the ever-increasing demands for UNILOY® Stainless Steel.

Completely new, this modern plant represents a major step in our corporate expansion program. It provides the finest facilities, production skills, engineering and metallurgical experience. It conforms to the policies maintained throughout our 75 year history, to constantly strive for highest quality standards in our products.

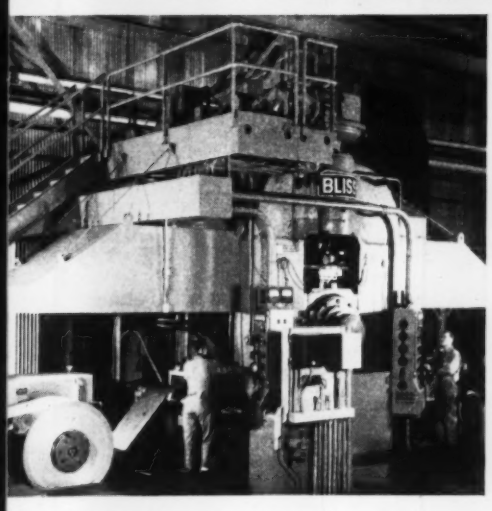
*Customer oriented* throughout, personnel and equipment are geared to meet the needs of our customers. Large stocks of finished coils are maintained at all times for prompt delivery.

**UNIVERSAL CYCLOPS**
UC STEEL
**STEEL CORPORATION**
**Bridgeville, Pa.**

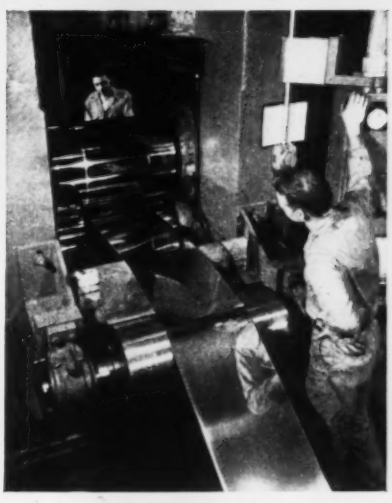
STAINLESS STEELS
TOOL STEELS • HIGH TEMPERATURE METALS

The most modern annealing and pickling line in the industry—over 600 ft. long. Handles two coils up to 24″ width.

# Stainless Strip Capacity

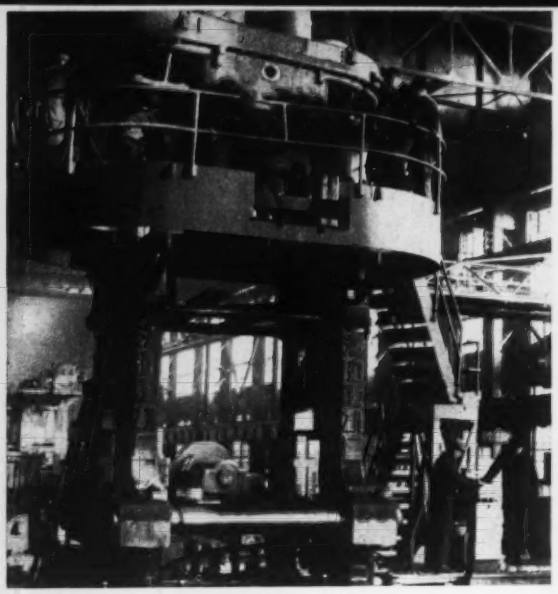


Modern four-high cold rolling mill.

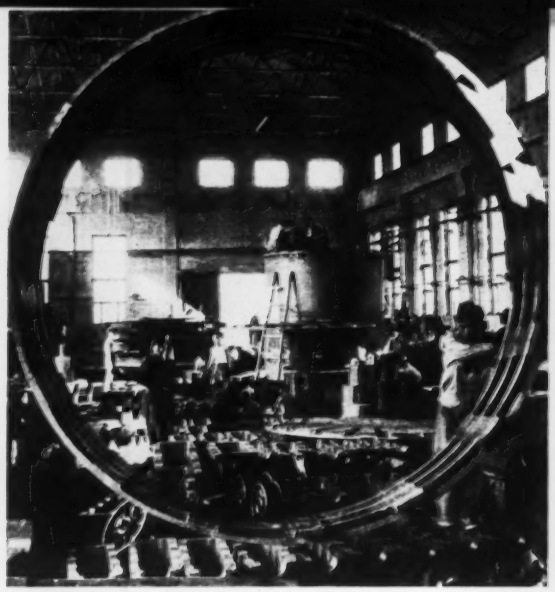


Temper mill provides top quality finish.

Large stocks of stainless steel coils—assure prompt delivery.



This blooming machine was produced at the Shenyang plant. Capacity: 800,000 to 1.2 million tons of blooms annually. It will be installed in a steel works in Tientsin



This is an assembly shop at the Shenyang mining equipment plant in northeast China where metallurgical mining machinery is made

**STEEL BOOM IN CHINA . . .**

correct this situation. Output of rolled steel is scheduled for a 50 per cent boost. Other priority projects include machine tools, power generating equipment, and vehicles.

The major ore and other raw material mines are expected to double production this year. Manganese, magnesium and silicon ore, dolomite, and fire clay output will climb steeply.

Existing batteries of ovens are not capable of doubling last year's coke production. The load will fall into hundreds of simplified batteries to be built this year. A 12 oven battery, designed at Anshan, will yield 10,000 tons of coke annually. Construction time: One month. Semimechanized, it can recover coal gas, tar oil, nitrogen, and benzol. Dairen, which produces most of the modern batteries, is to turn out 45 sets with an aggregate annual capacity of 500,000 tons.

About 600 sets of simplified equipment will reportedly yield 3 million tons of firebrick.

**• Tens of thousands of small iron smelting furnaces are being modernized and many tiny blast furnaces and converters are under construction.**

The blast furnaces are built in 10 to 14 days. Size: 10.4 to 36.4 cubic yards. Daily capacity: 8 to 35 tons. The shell is brick lined with heat resistant materials. Galvanized sheets are used for the hearth. These furnaces have upped pig iron production in Anhwei province, where iron and coal deposits are rich, from virtually nothing to over 1 million tons annually within six years. The Chinese now claim blast furnaces total over 78,000 cubic yards in volume.

**• Of the many small iron and steel furnaces put in operation last year, inefficient operations have been eliminated, the Reds claim.**

Others have been grouped into integrated systems with rolling mills and other equipment. The small furnaces account for half of the country's pig iron output.

A center being built at Tunghwa consists of five iron and steel complexes with 5000 small iron smelting furnaces and about 100 small blast furnaces. Each complex has an iron works with a 16.9 to 331.5 cubic yard blast furnace, a steel plant with 12 to 60 ton converters, open hearths, rolling mills, and coke plants. The largest facility will have

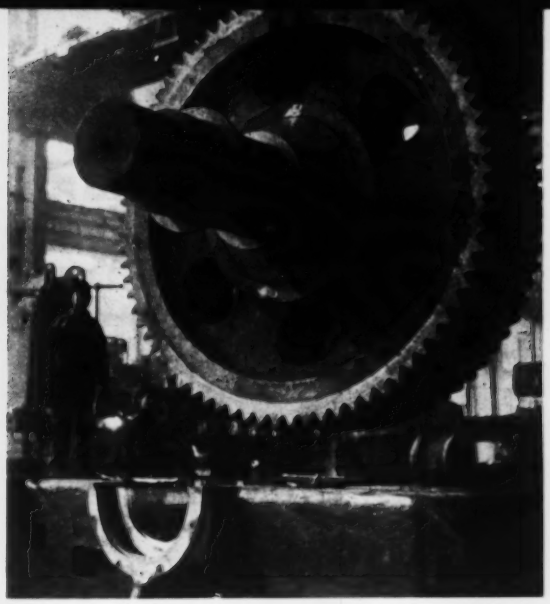
## Industrial Growth Is Rapid

(Production rates)

| | 1959* | 1958 | 1957 |
|---|---|---|---|
| Steel | 18 million tons | 11.1 million tons | 5.4 million tons |
| Pig Iron | 23 million tons | 13.7 million tons | 5.9 million tons |
| Coal | 380 million tons | 270 million tons | 135 million tons |
| Electric Power | 40 billion kw | 27.5 billion kw | 13.8 billion kw |
| Machine Tools (Metal Cutting) | 75 thousand units | 50 thousand units | 10 thousand units |

*Communist target.

**Big gears for ball mill machines are made at Shenyang. China's machine building industry is emphasizing rolling mill, power generating, coal washing, coke oven, mining, and irrigation equipment, and locomotives**



**The first Chinese steel sheet rolling mill was made at Taiyuan. The roller measures 29.9 in. in diameter and can turn out 30,000 to 50,000 tons of 47.2 in. wide plates. Workers are putting a gear in place**

these capacities: Pig iron, 800,000 tons; steel, 1 million tons; rolled steel, 800,000 tons; seamless steel tubes, 50,000 tons; coke, 1.8 million tons.

**• Construction at Anshan, China's leading steel center, will include new iron mining projects and facilities for ore dressing and coke production.**

A 1,966.9 cubic yard blast furnace was built at Anshan last year in four months and four days. It took three months and 21 days to build a 600 ton capacity open hearth.

The nation's second biggest iron and steel works, Wuhan, started production last year and is scheduled to manufacture steel and rolled products this year.

Paotow, Inner Mongolia, will make its first iron, steel, and steel products in 1959. The first coke oven went into operation in February.

In 1958, Shanghai's steel output increased from 500,000 to 1.22 million tons. The 1959 target: 1.6 million. The city's first blast furnace, a medium plate rolling mill, and a seamless tube mill (annual capacity: 50,000 tons) began production early this year. Another blast furnace and seamless tube mill are under construction.

**• Reports indicate the Chinese are making rapid technical advances.**

The average iron output of large blast furnaces per cubic yard of available volume per 24 hours reached 1.15 tons. Average 24-hour production by open hearths per square yard of furnace floor reached 6.48 tons. China's highest capacity open hearth at Anshan made a record fast heat in 10 hours 25 minutes compared with the scheduled 15 hours.

**• Marked success has been reported in desulfurizing pig iron yielded by local blast furnaces.**

In some areas, it is claimed, more than 80 per cent of such pig iron can be made into good steel. With the aid of an East German expert, the Tayeh steel plant, near Wuhan, has made carbon steel containing only 0.024 per cent sulfur from local pig iron and scrap. Steel from the open hearth was mixed with molten steel from an electric furnace containing 5 per cent basic slag. Steel of 0.057 per cent sulfur was produced from the open hearth furnace. When mixed with steel containing basic slag, the sulfur content of the mixture dropped to 0.024 per cent.

New products last year included many kinds of low alloy, high tensile structural steel, clad stainless sheet steel, 22 in. high I beams, and steel plates about 5 in. thick. Highlights of steelmaking equipment were the 1966.9 cubic yard blast furnace, a medium plate rolling mill which makes plates up to 91 in. wide, and a 2500 ton hydraulic press capable of forging 48 ton steel ingots. Early this year, the Taiyuan plant made a sheet rolling mill with a diameter of 30 in. and weighing 380 tons.

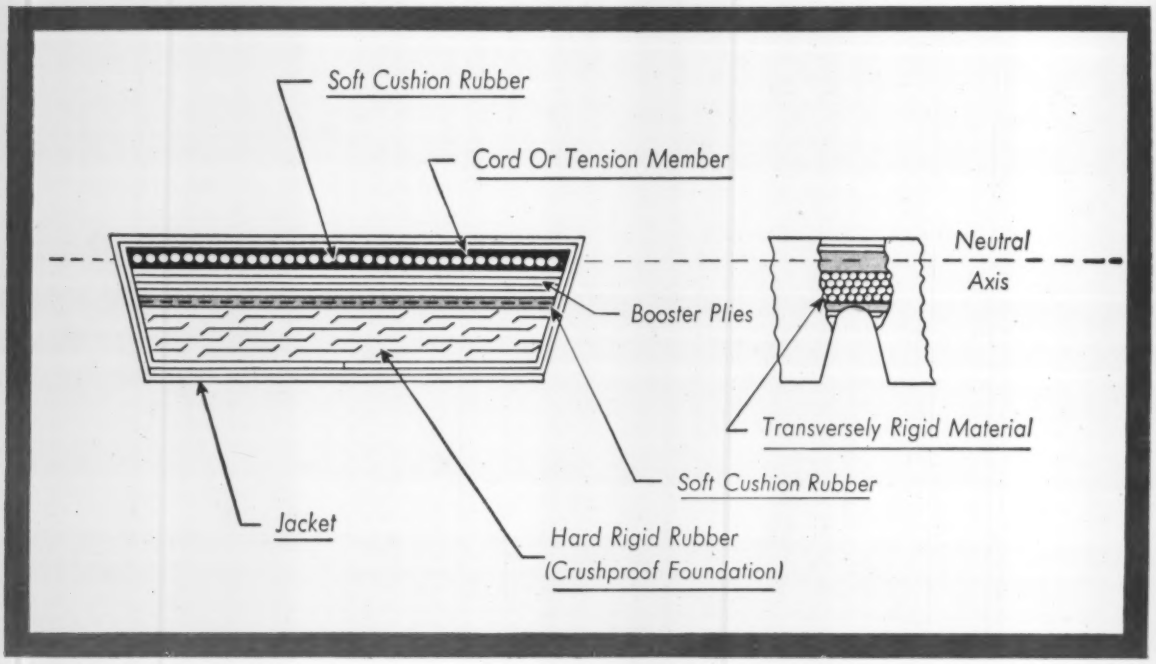
**• The machine building industry claims it can produce heavy and high precision machines meeting the highest world standards.**

An electronically controlled vertical lathe, a program controlled milling machine, precision lathe and gear grinding machines, a 16.4 ft hobbing machine, and a 45.9 ft double housing planer were among the major achievements. A Shanghai plant turned out a 14.8 ft vertical lathe this year. Previous size champ: 11.1 ft.

The training of technical personnel in China is forging ahead. Over 30,000 skilled workers have been trained in the last two years.

*This article is based on information gathered by Robert Westgate, Auckland, New Zealand.*

US RUBBER ROYAL VARIABLE SPEED BELT




# HERE'S WHY THIS VARIABLE BELT IS NON-SQUASH, NON-SAG

No excuse for any more variable speed belt problems. The U. S. Royal Variable Speed Belt will lick any production problem – where other belts try and fail.

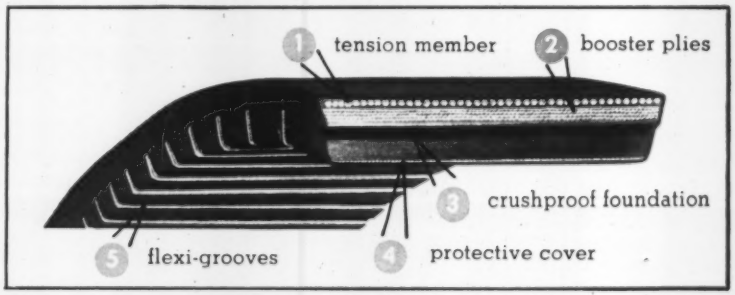
Note in the diagram the use of hard rigid rubber – the soft cushioning rubber in which cords or tension members are imbedded – the special jacket (oil and heat resistant).

The exclusive and complete crosswise rigidity in U. S. Royal prevents squashing. Lengthwise stretch is just about zero, by every test. *No sagging.*

U. S. Royal has complete accuracy regardless of speed changes – whether you switch from 2000 rpm to 10. It has scored a complete success in every textile mill, pulp and paper mill, chemical plant and metal working plant in which it has been installed.

• • •

**Your nearest "U.S." Power Transmission Distributor will be glad to demonstrate the U. S. Royal on your own drives, at your own plant. You'll save a great deal in replacement costs and down goes downtime.**




US RUBBER **Mechanical Goods Division**

**United States Rubber**

WORLD'S LARGEST MANUFACTURER OF INDUSTRIAL RUBBER PRODUCTS

Rockefeller Center, New York 20, N.Y. In Canada: Dominion Rubber Company, Ltd.

# SAE Looks at Foreign Competition

**Society of Automotive Engineers goes into session at Atlantic City, N. J., this week. Highlights of the meeting show what auto engineers are considering for future cars**

## WHICH SMALL CAR FOR YOU?

DRIVERS enjoy small cars, but larger automobiles will always have a host of friends: The passengers. That comment comes from Laurence Crooks, chief of Consumers Union's automotive division. Mr. Crooks says European drivers are more critical of a car's behavior. They don't want pushbuttons and power gadgets. Americans prefer comfort. Both like economy. Detroit's small cars are going the "economy-comfort" route instead of following the European philosophy.

This approach re-emphasizes Motordom's belief that Volkswagen and Renault will be able to hold their own in the economy car market, but cars like Opel, Volvo, and Peugot, which compete pricewise against Falcon, Convair, and Valiant, will have tough sledding.

**Europe's Car Production**

(In millions)

| | |
|---|---|
| 1959* | 4.1 |
| 1958 | 3.6 |
| 1957 | 2.9 |
| 1956 | 2.5 |
| 1955 | 2.4 |

*Projected. Includes France, England, Germany, Italy.

## COMMON MARKET NEEDS U. S. CAPITAL

EUROPE'S six Common Market countries contain 168 million people who potentially should buy 5.5 million to 6 million cars annually, one marketing researcher tells STEEL. Andre Laurent, secretary-general of Belgium's SAE, says 95 per cent of these vehicles will be in the 500 cubic centimeter to 2.2 liter (30.5 to 122 cu in.) class. He reports the 32 per cent tariff barrier means U. S. producers can profit in this market only through capital investments and subsidiary operations (see STEEL, June 8, p. 74). Holland and Belgium are likeliest countries.

Example: Foreign plants of the U. S. Big Three carbuilders account for 20 per cent of car and 14 per cent of truck production in Italy, France, Germany, Luxembourg, Belgium, and Holland.

## SPARE TIRES HAVE TO GO

LESS THAN HALF of the U. S. cars built in 1965 will have spare tires, predicts a car division vice president. Automakers need the extra trunk space, particularly in the smaller cars, he says. Despite the move, total wheel volume is expected to increase because more cars will be built.

R. E. Davies, B. F. Goodrich Co., and H. B. Hindin, U. S. Rubber Co., say that if the spare is eliminated, it will be necessary to provide tires that can travel 200 miles if punctured so they don't have to be dismounted on the road.

Under consideration are free flowing sealant particles within the tire, dual chambers, and auxiliary inner tubes that can be inflated with compressed air. Collapsible spare tires probably won't be used because they still take up trunk space.

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# Small Car Specifications*

| | Ford's Falcon | Chevrolet's Corvair | Chrysler's Valiant |
|---|---|---|---|
| Wheelbase | 109.5 in. | 108 in. | 106 in. |
| Length | 181.1 | 180.5 | 183.8 |
| Width | 70 | 69.5 | 70.1 |
| Height | 54.5 | 52 | 54.1 |
| Weight | 2350 lb | 2180 lb | 2600 lb |
| Engine Type | OHV in-line 6 cylinder | Opposed 6 (aluminum) | in-line 6 |
| Displacement | 144 cu in. | 121 cu in. | 170 cu in. |
| Horsepower | 86.5 | 92 | 120 |

*Anticipated.

## George Walker Predicts

George Walker, Ford Motor Co.'s styling vice president, predicts the next 50 years will bring these five developments in auto design:

1. Roofs made of glass with the structural strength of steel. Molecular structure of the glass will change with the angle of light to form a natural shade.

2. Smaller engines, some using chemical fuels similar to today's rocket engines.

3. Changes in basic proportions of cars to provide larger seating area without increasing over-all lengths and widths. This may be partly accomplished through unitized construction.

4. Greater simplicity of styling to get crisp, functional appearance.

5. Cars that move through the air similar to Ford's Levacar Mach I (see STEEL, June 8, p. 77). To get an idea of what such a car could look like, you'll want to enter STEEL's Beat-the-Experts Contest. Copies of a dream car rendering by Mr. Walker will be presented to the runners-up (see Page 5).

## Dodge Darts for 1960

Pioneer, Mohican, and Seneca are the series names of Dodge Div.'s new Dart line of cars to appear in September. Built on Plymouth's 118 in. wheelbase, the Dart is smaller than the regular Dodge and offers a full model range of hardtops, convertibles, and station wagons. It features semi-unitized body construction. Reported height: 52.2 in.

Styling will differ from Chrysler's 1960 regular finned lines. The Dart has crisper sheet metal, no fins. Power: Plymouth's revamped six cylinder engine. Optional: An eight cylinder powerplant. Two Dodge series are to replace the old three. Dart will be the lower priced series.

Although the compact car will compete with Plymouth, it is larger than Chrysler's small car, Valiant (not expected before early 1960). Dodge and imported Simca cars are to be marketed jointly. So will Plymouth, De Soto, and Valiant, say Chrysler sources. Chrysler and Imperial models will continue as duals. Some of these dealers will get Simcas too.

## Exhaust Notes

• Under its planned diversification program, Studebaker-Packard Corp. has purchased Gering Products Inc., Kenilworth, N. J., a producer of plastic compounds, polyethylene film, and plastic garden and industrial hose.

• Five month production for Ford is 788,067 cars and 145,440 trucks. Last year, the company built 508,915 cars and 98,358 trucks in five months. Chrysler Corp. reports 356,388 cars and 36,383 trucks vs. 259,953 cars and 24,625 trucks a year ago. General Motors' production for the same periods totals 1.32 million cars and 212,191 trucks against 1.04 million cars and 152,473 trucks.

• Lee Desmond, Dodge Div. assistant general manager, says Dodge buyers are getting away from colors. He claims white is the No. 1 choice. Black ranks second in the Midwest and East. Light colors are still preferred in the West.

• A French truck builder has introduced a diesel engine that will deliver 20 per cent more horsepower than conventional diesels and runs on such inexpensive fuels as unrefined crude oil.

• The government has ordered $13 million worth of Ford pickup and 1½ ton platform trucks to be delivered over the next six months. About half of the vehicles will be assembled at Ford Div.'s Norfolk, Va., facilities.

• Ford has selected Kenosha, Wis., as a new port of entry for English Ford and German Taunus automobiles.

## U. S. Auto Output

| Passenger Only | 1959 | 1958 |
|---|---|---|
| January | 545,757 | 489,515 |
| February | 478,484 | 392,132 |
| March | 576,085 | 357,048 |
| April | 578,825 | 316,594 |
| May | 546,817 | 349,613 |
| 5 Mo. Totals | 2,725,968 | 1,904,902 |
| June | | 337,446 |
| July | | 321,017 |
| August | | 180,447 |
| September | | 130,460 |
| October | | 261,701 |
| November | | 514,152 |
| December | | 593,920 |
| Total | | 4,244,045 |

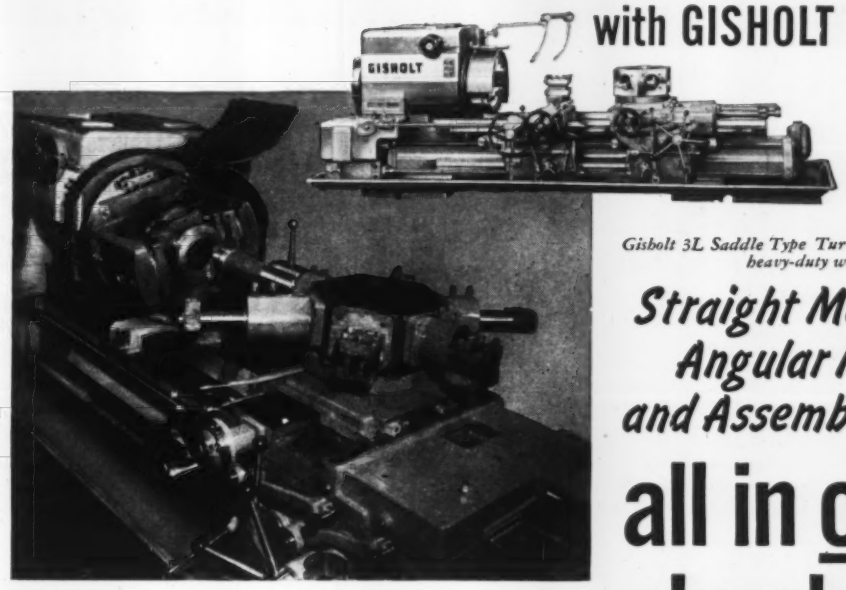
| Week Ended | 1959 | 1958 |
|---|---|---|
| May 9 | 134,763 | 78,506 |
| May 16 | 135,856 | 87,407 |
| May 23 | 133,568 | 86,082 |
| May 30 | 117,372 | 66,844 |
| June 6 | 126,298† | 73,696 |
| June 13 | 132,000* | 78,163 |

Source: *Ward's Automotive Reports.* †Preliminary. *Estimated by STEEL.

# *Nice work if you can do it...*

# and you can...

## with GISHOLT Turret Lathes...




*Gisholt 3L Saddle Type Turret Lathe—one of five sizes for heavy-duty work of all kinds*

## *Straight Machining... Angular Machining and Assembly...*

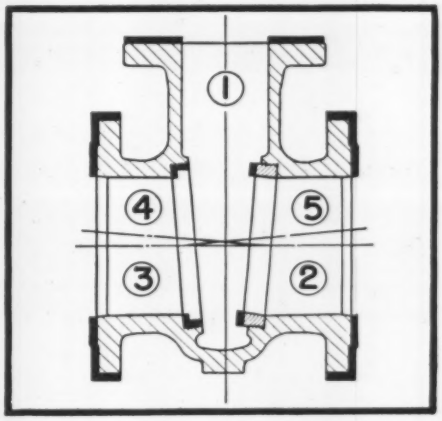
# all in one chucking!

Talk about time-cutting ideas, here's the versatility of a Gisholt 3L Saddle Type Turret Lathe paying off again.

All operations required to machine these gate valve bodies are done in a single chucking with a five-position indexing fixture. In addition to machining the bonnet and the two ends, the recesses for the two seat rings are bored and threaded at a five degree angle.

Then the seat rings are inserted—and tightly screwed in place with a driver mounted on the turret. The driving is done with a constant torque—adjustable to suit each job. The final operation is finish facing the seat ring after it is in place with the cross-feeding turret.

Gisholt Engineers have storehouses of ideas to help you increase your production. Ask one to call.




GISHOLT MACHINE COMPANY

Madison 10, Wisconsin, U.S.A.

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**ASK YOUR GISHOLT REPRESENTATIVE ABOUT GISHOLT FACTORY-REBUILT MACHINES WITH NEW MACHINE GUARANTEE**

*Now the nation's third largest steel plate producer*

The men who guide Lukens purchasing activities are, left to right, Edmund Pfeifer, Director of Purchases; E. Clair Book, Purchasing Consultant; and Albert W. Gudal, Purchasing Agent.

# LUKENS SALUTES ITS PURCHASING MEN

. . . for their important contribution to the company's growth. Purchasing is one of modern management's most valued skills. Lukens knows this well, for it has aided our progress consistently in recent years—especially during our "Phase A" expansion program which raised us to third position among steel plate producers. Lukens' experienced purchasing team worked closely with contractors to achieve on-time completion of this project, and is now geared to more critical procurement demands than ever.

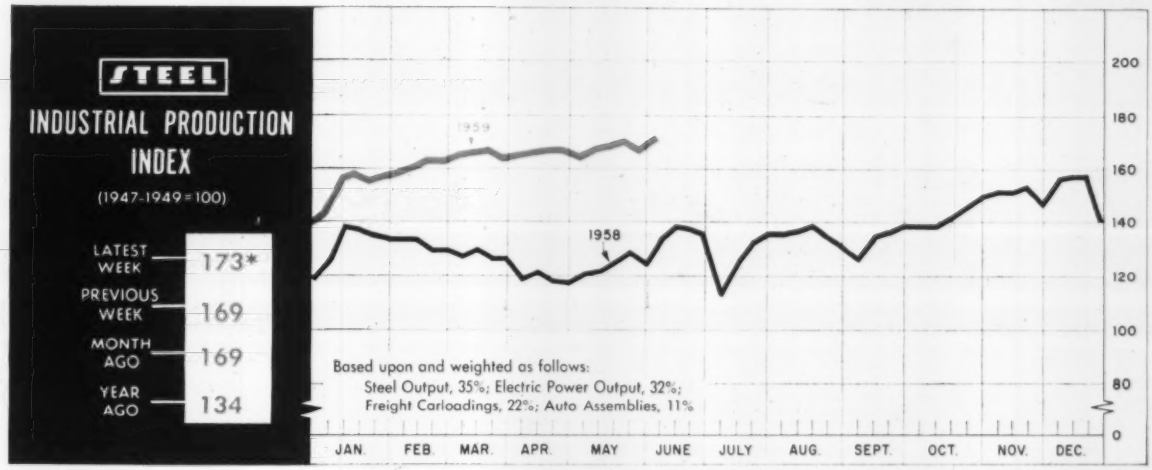
Our customers can now look forward to a growing supply of carbon and alloy steel plate, plate shapes, heads, weldments . . . Lukens "T-1," "Nine Nickel" and clad steels. In addition to greater capacity, the new facilities will provide even better steel plate quality.

Careful, competent purchasing was essential to the realization of "Phase A" objectives: *new capacity and quality levels to meet the growing demands of our plate fabricating customers.*
Lukens Steel Company, Coatesville, Pa.

***NEW CAPACITY ~ NEW QUALITY***

LUKENS ®

SERVING INDUSTRY WITH A WIDE RANGE OF SPECIALTY CARBON, ALLOY, ARMOR AND CLAD STEEL PLATE • HEADS • PLATE SHAPES • PLATE-MATE WELDING ELECTRODES AND WIRE




*Week ended June 6.

# Index Sets Fourth Record in Month

THE ECONOMY has reached a new high. After taking little more than a breather over the Memorial Day weekend, all hands turned to and pushed STEEL's industrial production index (preliminary) to a record 173 (1947-49=100).

It's the fourth week in the last five in which a record has been tied or broken. If the current trends among the components persist, the newest record will last only a week. When this string started in early May, the index read 169. The prerecession high was 168.

• **Summer Is Coming**—The principal factor in this latest show of strength is the electricity industry. Output of electrical energy is running about 14 per cent ahead of the year-ago figures, pushing the weekly figure above 13 billion kw-hr during the week ended June 6. It's the first time that level has been reached since the last full week in 1958. The upturn is seasonal, reflecting greater industrial activity and warmer weather.

The other three factors of the index are holding steady at high levels. Steel production has varied only slightly (less than 2 per cent) since the second week in March. With the exception of the weeks ended May 30 and June 6 (both of which were affected by holiday shutdowns) auto and truck production has been steady at about 160,000 units a week. While freight carloadings have been fairly steady at about 685,000 to 690,000 cars for the last four weeks, they showed a normal seasonal upturn prior to that time.

• **What's in Store**—But the era of weekly records is almost ended. The steel industry, which holds the key, is trying again to break the jinx that has prevented it from establishing another production record. During the week ended June 14, producers scheduled output of about 2,665,000 net tons for ingots and castings. It would top the peak

## BAROMETERS OF BUSINESS

| | LATEST PERIOD* | PRIOR WEEK | YEAR AGO |
|---|---|---|---|
| **INDUSTRY** | | | |
| Steel Ingot Production (1,000 net tons)[2] | 2,681[1] | 2,653 | 1,728 |
| Electric Power Distributed (million kw-hr) | 13,100[1] | 12,761 | 11,681 |
| Bituminous Coal Output (1,000 tons) | 8,155[1] | 8,355 | 7,189 |
| Crude Oil Production (daily avg—1,000 bbl) | 7,200[1] | 7,203 | 6,256 |
| Construction Volume (*ENR*—millions) | $315.7 | $679.1 | $481.4 |
| Auto, Truck Output, U. S., Canada (*Ward's*) | 163,729[1] | 153,678 | 97,877 |
| **TRADE** | | | |
| Freight Carloadings (1,000 Cars) | 690[1] | 688 | 613 |
| Business Failures (Dun & Bradstreet) | 264 | 259 | 278 |
| Currency in Circulation (millions)[3] | $31,641 | $31,473 | $30,989 |
| Dept. Store Sales (changes from year ago)[3] | +5% | +9% | −1% |
| **FINANCE** | | | |
| Bank Clearings (Dun & Bradstreet, millions) | $24,135 | $23,614 | $20,547 |
| Federal Gross Debt (billions) | $286.4 | $285.8 | $275.7 |
| Bond Volume, NYSE (millions) | $27.6 | $26.4 | $29.7 |
| Stocks Sales, NYSE (thousands of shares) | 14,786 | 14,873 | 13,530 |
| Loans and Investments (billions)[4] | $94.6 | $94.9 | $92.1 |
| U. S. Govt. Obligations Held (billions)[4] | $28.7 | $29.0 | $31.1 |
| **PRICES** | | | |
| STEEL's Finished Steel Price Index[5] | 247.82 | 247.82 | 239.15 |
| STEEL's Nonferrous Metal Price Index[6] | 222.2 | 222.0 | 194.2 |
| All Commodities[7] | 119.5 | 119.5 | 119.1 |
| Commodities Other than Farm & Foods[7] | 127.8 | 127.8 | 125.2 |

*Dates on request. [1]Preliminary. [2]Weekly capacities, net tons: 1959, 2,831,486; 1958, 2,699,173. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-39=100. [6]1936-39=100. [7]Bureau of Labor Statistics Index, 1947-49=100.

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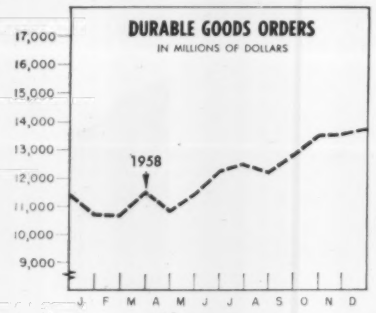
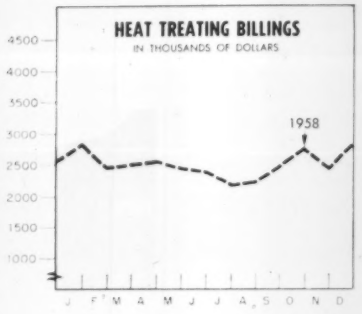
*Firm* _____
*Address* _____
_____
*I want to clean* _____
*Sales Engnr. to call?* Yes ☐ No ☐

## THE BUSINESS TREND




| | New Orders* 1959 | New Orders* 1958 | Sales* 1959 | Sales* 1958 |
|---|---|---|---|---|
| Jan. | 13,900 | 10,704 | 13,541 | 12,646 |
| Feb. | 14,918 | 10,688 | 13,870 | 12,038 |
| Mar. | 15,300† | 11,488 | 14,400† | 11,670 |
| Apr. | 15,600† | 10,833 | 15,100† | 11,532 |
| May | ..... | 11,423 | ..... | 11,643 |
| June | ..... | 12,245 | ..... | 12,086 |
| July | ..... | 12,512 | ..... | 12,256 |
| Aug. | ..... | 12,177 | ..... | 12,385 |
| Sept. | ..... | 12,859 | ..... | 12,723 |
| Oct. | ..... | 13,530 | ..... | 12,943 |
| Nov. | ..... | 13,574 | ..... | 13,295 |
| Dec. | ..... | 13,673 | ..... | 13,613 |

*Seasonally adjusted. †Preliminary.
U. S. Office of Business Economics.

| | 1959 | 1958 | 1957 |
|---|---|---|---|
| Jan. | 2,915.5 | 2,825.5 | 3,533.9 |
| Feb. | 2,976.0 | 2,466.3 | 3,378.9 |
| Mar. | 3,397.3 | 2,490.5 | 3,631.8 |
| Apr. | 3,420.6 | 2,538.0 | 3,572.4 |
| May | ..... | 2,421.5 | 3,389.6 |
| June | ..... | 2,374.8 | 2,912.1 |
| July | ..... | 2,139.6 | 2,767.5 |
| Aug. | ..... | 2,213.0 | 2,830.8 |
| Sept. | ..... | 2,457.1 | 2,765.0 |
| Oct. | ..... | 2,744.9 | 3,076.2 |
| Nov. | ..... | 2,422.0 | 2,677.2 |
| Dec. | ..... | 2,799.4 | 2,579.3 |

Metal Treating Institute.

Charts copyright, 1959, STEEL.

reached in mid-April, but it must be pointed out that operating schedules have fallen short every week since then.

If steelmakers don't make it this week, their chances for a record are gone until sometime in the fourth quarter. Unless a contract settlement is in sight by the middle of this week, they will be forced to start cutting operations to be ready for a strike on July 1. Even if a settlement seems certain, operations will be cut back to a more normal summer level.

## Recovery Base Is National

The basis for this spring upturn has been broad. As the First National City Bank of New York puts it: "The advance is being felt throughout the economy—in manufacturing, trade, and services." To this might be added: "In every section of the nation." Hopscotching around the country, here is what you will find:

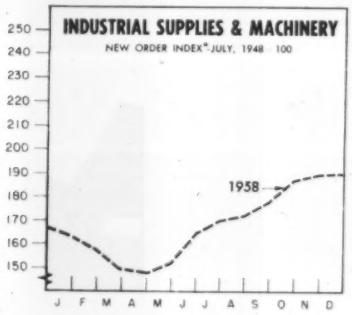
In Southern California, the business activity index of the Los Angeles Security First National Bank has risen for 13 consecutive months, the last seven of which have produced record levels.

In the Third Federal Reserve District, manufacturing output is running better than 12 per cent ahead of the year ago pace, say Fed officials at Philadelphia. Employment statistics, which had been lagging the national scene, are showing signs of improving.

Business activity in the Pittsburgh area is being spurred by heavy steel production, but other areas of business are responding about as well. The weekly index of the Bureau of Business Research at the University of Pittsburgh is holding slightly below the all-time high of late 1956. In the most recent period, industrial production and originating freight shipments reached new 1959 highs.

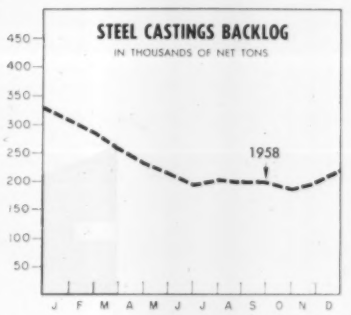
In the Tenth Federal Reserve District, better business is reflected by a significant increase in bank loans. Officials at the district's headquarters in Kansas City, Mo., say that loans in the first quarter were $43 million above what they were in 1958's period, with business loans accounting for $19 million, more than any other category. Department store sales for the district are up 11 per cent to date, which is considerably better than the national increase of 8 per cent.

Nonagricultural employment in




| | 1959 | 1958 | 1957 | 1956 |
|---|---|---|---|---|
| Jan. | 186 | 163 | 221 | 190 |
| Feb. | 202 | 157 | 219 | 190 |
| Mar. | 221 | 149 | 210 | 190 |
| Apr. | 218 | 148 | 203 | 195 |
| May | ... | 152 | 199 | 199 |
| June | ... | 164 | 199 | 197 |
| July | ... | 170 | 197 | 203 |
| Aug. | ... | 172 | 197 | 211 |
| Sept. | ... | 178 | 203 | 203 |
| Oct. | ... | 187 | 192 | 206 |
| Nov. | ... | 189 | 180 | 220 |
| Dec. | ... | 190 | 167 | 218 |

*Seasonally adjusted.
Amer. Supply & Machinery Mfrs.' Assn.




| | Shipments | | Unfilled Orders* | |
|---|---|---|---|---|
| | 1959 | 1958 | 1959 | 1958 |
| Jan. | 105.4 | 120.7 | 232.6 | 304.9 |
| Feb. | 110.3 | 103.3 | 245.1 | 282.4 |
| Mar. | 131.3 | 106.2 | 270.7 | 252.8 |
| Apr. | .... | 91.5 | .... | 229.5 |
| May | .... | 87.0 | .... | 211.3 |
| June | .... | 92.9 | .... | 190.8 |
| July | .... | 68.8 | .... | 200.3 |
| Aug. | .... | 80.9 | .... | 196.3 |
| Sept. | .... | 85.3 | .... | 196.5 |
| Oct. | .... | 95.4 | .... | 184.9 |
| Nov. | .... | 85.3 | .... | 194.0 |
| Dec. | .... | 103.8 | .... | 214.4 |
| Total | .... | 1,121.1 | | |

*For sale. U. S. Bureau of the Census.

Arizona was at a peak in the latest reporting period, says the Valley National Bank of Phoenix. The biggest gains have been marked up by contract construction and manufacturing. The bank's business index stands at 205.9 per cent of the 1947-49 base (seasonally adjusted), which is fractionally below the record established earlier in the year.

Manufacturing and construction industries are leading the uptrend in employment in Utah, reports the University of Utah's Bureau of Economic & Business Research. Even though the state lagged the national employment figures, the number of nonagricultural jobholders in April set a high mark for that month. Steel output in the state (Columbia-Geneva Steel Div. of U. S. Steel) is at an all-time high.

From New England comes word that capital goods spending is picking up. The Boston Federal Reserve Bank has found that manufacturers plan a 2 per cent increase over 1958's expenditures. Last fall, the same executives indicated a 14 per cent cutback from the 1958 level. The New England area is also seeing a pickup in nonferrous metals, one of its more important industries. And shipbuilding is holding up well. One of the most outstanding comebacks is being staged by nonelectrical machinery, with machine tools and textile machinery leading the way.

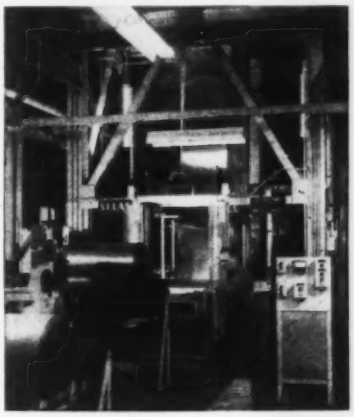
A word of caution is voiced by the First National Bank of Boston: "While business and consumers alike are generally optimistic about the outlook, and rightly so, it should be recognized that we are clearly at a level of activity where we become increasingly vulnerable to a testing period."

## Trends Fore and Aft

• Truckmakers are heading for a 1-million-unit-or-better year. John C. Virden, chairman and president of Eaton Mfg. Co., Cleveland, declares that the two main forces behind the surge are the road building program and the growing trend toward over-the-road freight traffic.

• Intercity truck tonnage in the week ended May 30 was 29.8 per cent ahead of what it was in the corresponding week of 1958, says the American Trucking Associations Inc. Railroad freight carloadings were also 29.8 per cent ahead of the year ago figure during the same week, says the Association of American Railroads.

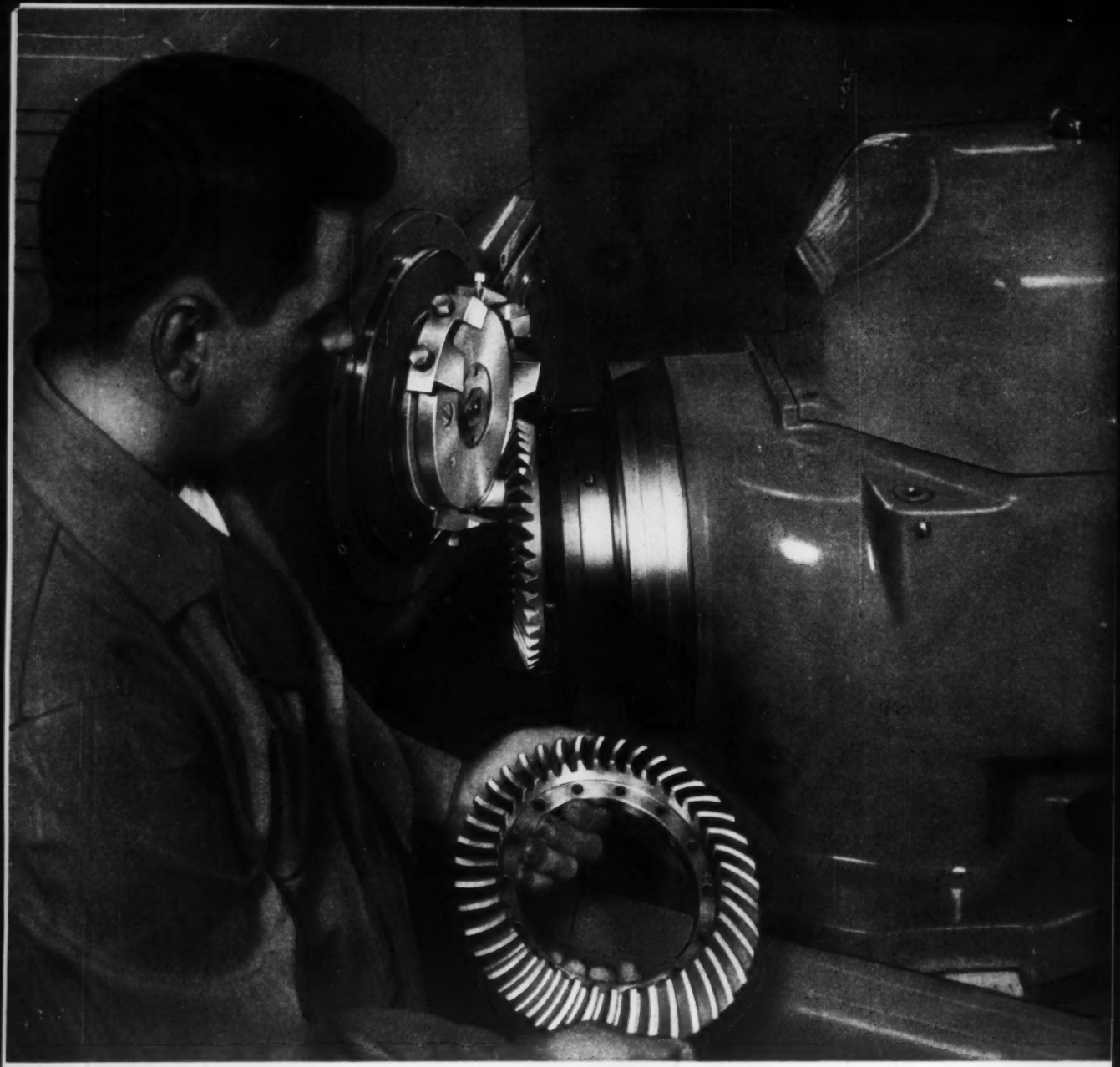
To meet demands for perfect finish on stainless and nickel Thinstrip®, Somers installs unique new annealing furnace.



This new Selas vertical continuous annealing furnace assures uncontaminated, commercially unmarred surfaces as well as uniform temper and faster delivery on stainless, nickel and nickel alloy Thinstrip up to 25" wide. But this is only part of the story of Somers' quality. Sendzimir rolling mills, Accu-Ray gauging plus 50 years leadership in thin gauge metals (from .010 down to .000125") are a few of the features Somers offers to assist you with your Thinstrip® problems.

Write for Confidential Data blank — no cost or obligation.

FOR EXACTING STANDARDS ONLY
Somers
Somers Brass Company, Inc.
104 BALDWIN AVE. WATERBURY, CONN.



# Helixform*—a new method for bevel gear production!

The new No. 112 Hypoid Helixform Gear Finisher assures improved quality and increased production on spiral bevel and hypoid non-generated ring gears up to 10½″ in diameter, and 2½ DP such as employed in passenger car axles.

The Helixform Cutting Method used on this machine offers these advantages:

*Conjugate tooth surfaces, minimized gear development, complete control of tooth bearing, and greater adjustability in final assembly.*

We will be glad to send a bulletin giving further details on request. Ask for literature on the No. 112 Hypoid Helixform Gear Finisher and the companion No. 112 Hypoid Gear Rougher. Write for it today.

*Trade-Mark

**GLEASON WORKS**

1000 UNIVERSITY AVE., ROCHESTER 3, N.Y.

69-A

H. M. PATTON
*American Hoist works mgr.*

JAMES W. COULTRAP
*MGD executive v. p.*

DONALD J. NEARY
*Bridgeport Thermostat post*

ROBERT F. SHANNON
*Detroit Sintered Metals post*

**H. M. Patton** fills the new post of works manager, **American Hoist & Derrick Co.**, St. Paul. He continues as president of Valley Iron Works, acquired by American Hoist in 1958.

**James W. Coultrap** was promoted to executive vice president of **Miehle-Goss-Dexter Inc.**, Chicago, and its Miehle Co. Div. He was secretary and vice president of Miehle Co., and secretary of the parent corporation.

**Robert L. Strawbridge**, former group vice president, **Houdaille Industries Inc.**, Buffalo, was promoted to vice president - manufacturing. **G. C. Saltarelli**, senior vice president, assumes additional executive responsibilities which brings him in direct working relationship with the chairman, plus executive supervision over both the Manufacturing Div. and Construction Materials Div.

**William R. Kennedy** was made sales manager, **Hammel-Dahl Div.**, Warwick, R. I., General Controls Co.

**A. B. Carlson** was elected vice president-engineering, **H. D. Conkey & Co.**, Mendota, Ill. He was chief engineer.

**Howard R. Hammond** was made general manager of the newly created Defense Products Div., **Allis-Chalmers Mfg. Co.**, Milwaukee.

**D. F. McCarron** was named vice president-sales, **Globe Hoist Co.**, Philadelphia. He was president of Loyd Scruggs Co., St. Louis.

**Donald J. Neary** was named production manager, **Bridgeport Thermostat Div.**, Milford, Conn., Robertshaw-Fulton Controls Co. He was assistant production manager.

**John B. Darrah** was made vice president-general manager, Defense Div., **Budd Co.**, Philadelphia. For the last five years, Mr. Darrah has been assistant works manager in charge of dies, jigs and fixtures, and has also participated with atomics engineers in design and development for the aircraft nuclear propulsion program.

**Daniel A. Porco** was appointed to the new post of assistant to the president of **Crucible Steel Co. of America**, Pittsburgh. He was manager of the corporate development section. **Robert B. Hewett**, chief industrial engineer, was named to succeed Mr. Porco. **George I. Ziders**, works industrial engineer, Sanderson-Halcomb plant, Syracuse, N. Y., replaces Mr. Hewett.

**Robert F. Shannon** was made general manager, **Detroit Sintered Metals Corp.**, Kalamazoo, Mich., subsidiary, Bunting Brass & Bronze Co. He succeeds **Henry F. Latva**, who transferred to the Toledo, Ohio, office on special assignment. Mr. Shannon for the last ten years has been with P. R. Mallory Co., most recently in charge of manufacturing at its Mallory-Sharon Metals Div., Huntsville, Ala.

**Edmond T. Duffy** was named executive assistant to the vice president and director of sales, **Electric Auto-Lite Co.**, Toledo, Ohio. For the last ten years, he has been with Weatherhead Co. in sales management posts.

**J. F. Miller** was made sales manager, secondary sheet products, at **Weirton Steel Co.**, Weirton, W. Va., division of National Steel Corp.

**Pfaudler Permutit Inc.**, Rochester, N. Y., appointed Vice President

DANIEL A. PORCO ROBERT B. HEWETT GEORGE I. ZIDERS
*management posts at Crucible Steel Co. of America*

JERRY CAPRIO

JOHN STEINEBACH

*A. P. Smith promotions*

GEORGE A. FORT

ROBERT CAMPBELL

*Gary Steel Wks. appointments*

**George C. Calvert** to direct its newly created International Div.

**Jerry Caprio** was promoted to manager of engineering, **A. P. Smith Co.**, East Orange, N. J. **John Steinebach** was promoted to assistant plant superintendent.

**C. C. Helmle** was appointed vice president-general manager, **Enthone Inc.**, New Haven, Conn., a subsidiary of American Smelting & Refining Co. He continues as sales manager.

Four district sales managers named by **Republic Steel Corp.** are: **Charles W. Kennedy**, Houston; **Henry A. Bourne**, Tulsa, Okla.; **L. Fred Renneckar**, San Francisco; **L. Alex Wigley**, Seattle.

**M. J. Steffes**, vice president, **Super Tool Co.**, division of Van Norman Industries, Detroit, was elected executive vice president. He has been vice president-sales and director of research.

At the Gary, Ind., Works of **U. S. Steel Corp.**, **George A. Fort** was named assistant to the general superintendent-cost improvement. He is replaced as superintendent, Coke & Coal Chemicals Div., by **Robert Campbell**, who was assistant division superintendent-coke and coal chemicals, Clairton, Pa., Works.

**John C. Cassidy** was appointed Chicago district sales manager, **Page Steel & Wire Div.**, American Chain & Cable Co. Inc.

**Kenneth O. Parker** was made chief engineer, **United Aircraft Products Inc.**, Dayton, Ohio. He was assistant chief engineer. **Frank A. Ryan** was made vice president-sales; **Frank J. Coykendall**, treasurer.

**Edward O. Falberg** was appointed division manufacturing manager, **Bohn Aluminum & Brass Corp.**, Detroit, responsible for manufacturing operations of two of Bohn's plants at Greensburg, Ind., and at Holland, Mich. **Carl F. Brown** succeeds Mr. Falberg as plant manager at Greensburg.

**Wilfred H. Best** transfers from General Motors Corp.'s Chevrolet Div. in Detroit to the **Frigidaire Div.**, Dayton, Ohio, as manager of material and production control. **I. C. Hartzell**, former manager-material control and purchasing for Frigidaire, has retired. **Joel T. Heavin**, director of purchases under Mr. Hartzell, becomes purchasing agent, reporting to the general manager.

**William N. Hoelzel**, **C. R. Anderson**, and **John P. Quinlan** were named assistant vice presidents-sales of the Gary, Ind., Div., **Screw & Bolt Corp. of America.**

**James M. Kimbrough Jr.** was made sales manager, Sheet & Strip Div., **Republic Steel Corp.**, Cleveland.

**Edward I. Renouard** was elected vice president-western operations, **Anaconda Co.**, New York. Manager of mines, Butte, Mont., since

M. J. STEFFES

*Super Tool exec. v. p.*

KENNETH O. PARKER

*United Aircraft chief eng.*

EDWARD O. FALBERG

*Bohn Aluminum div. mfg. mgr.*

EDWARD I. RENOUARD

*Anaconda v. p.-western*

# ON THE BALL

# 500,000 TIMES A DAY BRIDGEPORT Free-Machining Brass Rod!

Because ball point pens are in everyday use, production of vital brass tips becomes astronomical along with quality control problems.

These tips – one of which is shown much enlarged – are produced at ultra-high speeds. The brass rod needed for them must be flawless in every respect. *Consistent* metallurgical composition, *precise* dimensional tolerances and *unvarying* standards of machinability – if any of these qualities vary even a fraction, production comes to a frequent and costly halt.

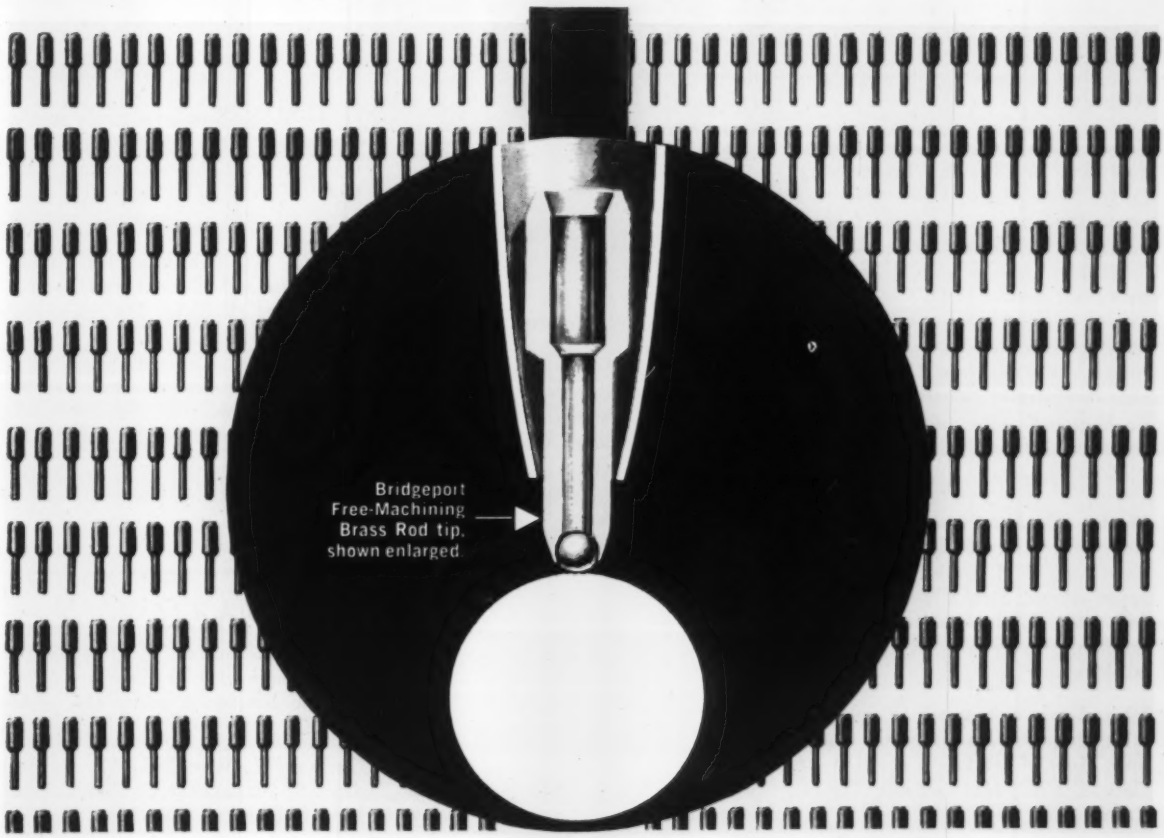
That's why Revere Metal Art Co., Inc., New York City, specifies Bridgeport Free-Machining Ball Point Pen Brass Rod for these inserts. It meets all requirements for precision, straightness, workability, machinability and tolerances – and, in addition, provides a surface finish that keeps finishing time and costs to a minimum.

Whether you use rod, strip or tube, you can count – just as Revere does – on getting consistent quality every time you specify Bridgeport Brass Alloys. It will pay you to get the complete story. Call your nearest Bridgeport Sales Office or write us direct for a complete list of Bridgeport products – Dept. 3907.

**BRIDGEPORT BRASS COMPANY**

BRIDGEPORT 2, CONNECTICUT

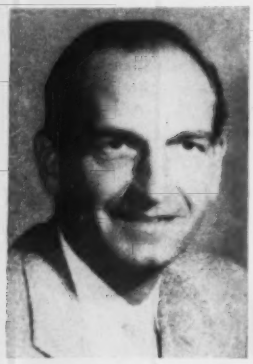
*Specialists in Metals from Aluminum to Zirconium*



THOMAS O. ENGLISH
*Alcoa gen. purchasing agent*

EDWARD F. SCHWEICH
*Lewin-Mathes president*

NORMAN W. TUCKER
*Youngstown Sheet dept. supt.*



RUSSEL J. STAINTON
*Perkin Eng. plant mgr.*

JAMES M. PLANTEN
*joins Foundry Design*

ERNEST A. SIEMSSEN
*Selas div. chief eng.*

1952, he succeeds the late **Chester H. Steele.**

**Russel J. Stainton** was named plant manager of **Perkin Engineering Corp.**, El Segundo, Calif. He was production manager of Elgin Instrument Co. **Jack E. Laisure** was made secretary-treasurer; **John F. Palinkas,** personnel manager.

**Sterling Electric Motors Inc.**, Los Angeles, elected **John R. Eastman** vice president-engineering; **William E. Hoppock,** vice president-manufacturing; **Leonard A. Johnson,** vice president-finance.

**Wesley D. Hamilton** was elected chairman; **James B. Igleheart,** president and chief executive officer of **International Steel Co.**, Evansville, Ind. Mr. Igleheart, executive vice president, succeeds Mr. Hamilton as president.

**John Asma** was appointed general sales manager, **International Couplings Inc.**, Cleveland, division of Gabriel Co. He succeeds **C. N. Ruscitti,** resigned.

**James M. Planten** joined **Foundry Design Co.**, St. Louis (affiliate of Sorbo-Mat Process Engineers) as vice president and associate. He was vice president of Lester B. Knight & Associates Inc.

**Ernest A. Siemssen,** former production manager, was made chief engineer, Automatic Machinery Div., **Selas Corp. of America,** Dresher, Pa.

**R. C. Conover** was made western district works manager, Refractories Div., **H. K. Porter Company Inc.** He will supervise operations of western district plants, which include Laclede and Christy in St. Louis; Bessemer, Ala.; Ottawa, Ill.; and Canon City, Col.

**William M. Haile** was elected a vice president, **Union Carbide Corp.**, New York. He will supervise activities of three divisions: Linde Co., National Carbon Co., and Union Carbide Metals Co. **William B. Nicholson** was appointed president of Linde Co. to succeed Mr. Haile.

**Thomas O. English** was appointed general purchasing agent, **Aluminum Co. of America,** Pittsburgh, and its subsidiaries. He was assistant general purchasing agent.

**Edward F. Schweich** was elected president, **Lewin-Mathes Co.**, New York, division of Cerro de Pasco Corp. He succeeds **Richard H. Lewin,** recently made vice president of the parent firm. Mr. Schweich was executive vice president of Lewin-Mathes.

At the Sheet & Tin Div., Indiana Harbor Works, East Chicago, Ind., **Youngstown Sheet & Tube Co., Norman W. Tucker** was made superintendent of the No. 1 Tin Mill Cold Reduction Dept. **Paul J. Barliak** was made assistant superintendent, Sheet Mill; **Rudolph F. Spacek Jr.,** assistant superintendent, No. 2 Tin Mill.

**G. W. Royce** was made manager of the Toledo, Ohio, plant of **U. S. Reduction Co.** He was plant manager at East Chicago, Ind.

**William D. Dickey** was elected treasurer of **Universal-Cyclops Steel Corp.**, Bridgeville, Pa. He was executive vice president of Magnetics Inc.

**James M. Murphy** was made works engineer at the Pittsburg, Calif., Works, **Columbia - Geneva Steel Div.**, U. S. Steel Corp. He succeeds **William A. Marshall,** retired.

**William T. Strickland** was made New England district sales manager, Steel & Tube Div., **Timken Roller Bearing Co.** He is in Boston. Former sales engineer in the Detroit office, he is replaced by **Bruce R. Wise.**

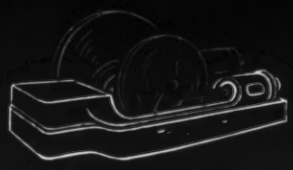
**Alfred A. Michaud** joined **Nuclear Corp. of America** as vice president and general manager of its West Coast Div., Burbank, Calif.

## *OBITUARIES...*

**Stanley M. Brown,** 57, Philadelphia plant manager, Industrial Div., **Electric Storage Battery Co.**, died May 25.

**Carlton M. Wheelock,** 72, former district manager of **Kennametal Inc.**, Milwaukee, died May 26.

# CAST STEEL "Seat of Power"...76 TONS OF IT!



Here's half of a 152 ton cast steel reciprocating engine bed—the other half is on the shipping dock. Each half is a one piece steel casting 33 feet long, 9 feet wide and 5 feet at its maximum height . . . typical of the diverse steel castings turned out in our foundries.

Metallurgists, engineers and experienced foundrymen team up here to produce quality steel castings of all shapes and sizes for rolling mills, cement mills, ships, diesel engines, hydro-electric turbines and engines, steam hammers, presses and all types of industrial machines. Today's experience in the quality control of steel castings and forgings here is the product of many years serving a wide diversity of industries.

You can be sure of the results you expect . . . consult with us on your cast and forged steel requirements.

•

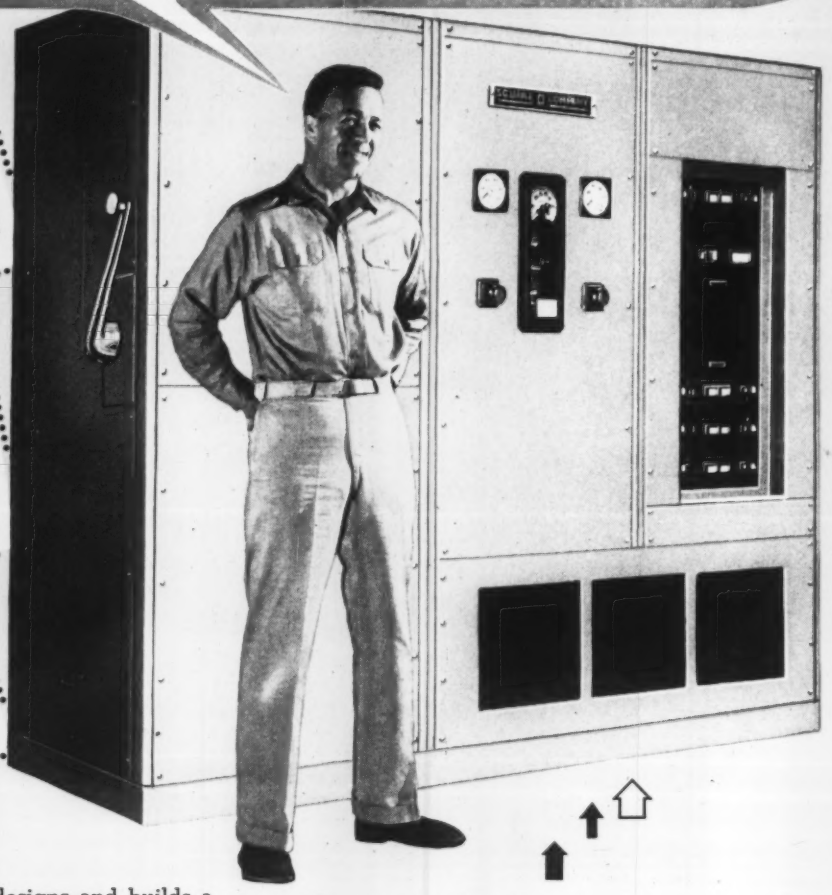
MEMBER

Build With Steel Castings

## ERIE FORGE & STEEL CORPORATION

ERIE, PENNSYLVANIA

# *Power-zOne* UNIT SUBSTATIONS
## HAVE EVERYTHING...INCLUDING COMPACTNESS!



Can be moved through normal commercial doorways

Save valuable space —can be placed against the wall

Capacities up to 300 KVA

• Square D designs and builds a complete line of substations for any application, indoor or outdoor—with dry or liquid-filled transformers—with large air-breakers or molded case breakers—with motor control units.

If you have any questions pertaining to substations, call in your Square D Field Engineer or write for literature describing space and cost saving with Square D's "*Power-zone*" design.

Address Square D Company, 6060 Rivard Street, Detroit 11, Michigan.

### *Power-zOne* DESIGN PAYS OFF!

**MINIMUM SIZE AND EASY HANDLING**

- Only 79½" high, 36" deep and 94" wide
- All components front-accessible

**EQUIPPED TO BEST FIT YOUR APPLICATION**

- **High Voltage** • Air interrupter switch or oil cutouts, fused or unfused
- **Transformer** • Dry type; quiet; up to 300 KVA and up to 5 KV primary; winding taps easily accessible through front grille
- **Low Voltage** • Molded case circuit breakers; QMB fusible switches and motor starters; metering equipment. Full 72" of panel space available for these devices

**EC&M HEAVY INDUSTRY ELECTRICAL EQUIPMENT...NOW A PART OF THE SQUARE D LINE**

**SQUARE D COMPANY**

*Stainless steel strip rolls off new Coshocton mill as . . .*

# Universal-Cyclops Expands

UNIVERSAL - CYCLOPS Steel Corp., Bridgeville, Pa., has increased its stainless steel strip capacity 167 per cent to meet the steadily expanding needs of its customers—chiefly automobile and appliance manufacturers.

A new plant at Coshocton, Ohio, has a capacity of 20,000 tons of stainless strip a year. This supplements the 12,000 ton capacity of the Bridgeville mill which will place increased emphasis on all types of specialty strip (high speed and tool steel strip, high temperature metals strip, and magnetic metals strip).

• **New Facilities** — The Coshocton facility contains 137,000 sq ft. Equipment includes a 30 in., 4 high reversing mill which cold reduces strip as wide as 24 in. down to thicknesses of 0.012 in. It processes coils up to 18,000 lb at speeds as high as 1000 fpm.

Two coils of strip, each up to 24 in. wide and weighing as much as 18,000 lb, are handled simultaneously on the 627 ft annealing and pickling line.

Another major piece of equipment is a 2 high temper mill. It provides a lustrous finish (as seen in the picture above) and proper hardness.

Hot-rolled coils for the Coshocton plant are temporarily being supplied from the Bridgeville plant and from other sources. They will be supplied soon from a continuous strip mill at the Mansfield, Ohio, plant of Empire-Reeves Steel Co., a subsidiary of Universal-Cyclops.

• **Expansion Plans**—Over $8 million has been invested to date and firm commitments have been made for the expenditure of an additional $5 million at Coshocton this year. This is part of an over-all expansion program started in 1958 that will cost around $45 million through 1961.

Items to be added this year at Coshocton include a light gage annealing and pickling line. A two or three bay addition of 76,000 sq ft will be built to house a heavy gage annealing and pickling line, three bell type annealing furnaces for straight chromium grades of stainless, two continuous annealing furnaces for chrome-nickel grades, and a two stand pickling line.

Also included in this year's program is an appropriation of $11.5 million for the Mansfield plant. New equipment will include slab reheating furnaces, a 56 in., 4 high, cold reversing mill, and modifications of rolling equipment to permit processing of stainless. By the end of this month, the Mansfield plant will make its first shipment of hot-rolled stainless coils to Coshocton.

An additional $12.5 million to $17.5 million will be spent at Mansfield in 1960. Capacity of open hearth furnaces will be increased from 500,000 tons to 600,000 tons annually by using bigger ladles, better charging equipment, and (possibly) oxygen roof lances. An electric arc furnace of 60 to 80 ton capacity will be installed.

In 1961, $10 million to $15 million will be spent at various plants for continued expansion and modernization.

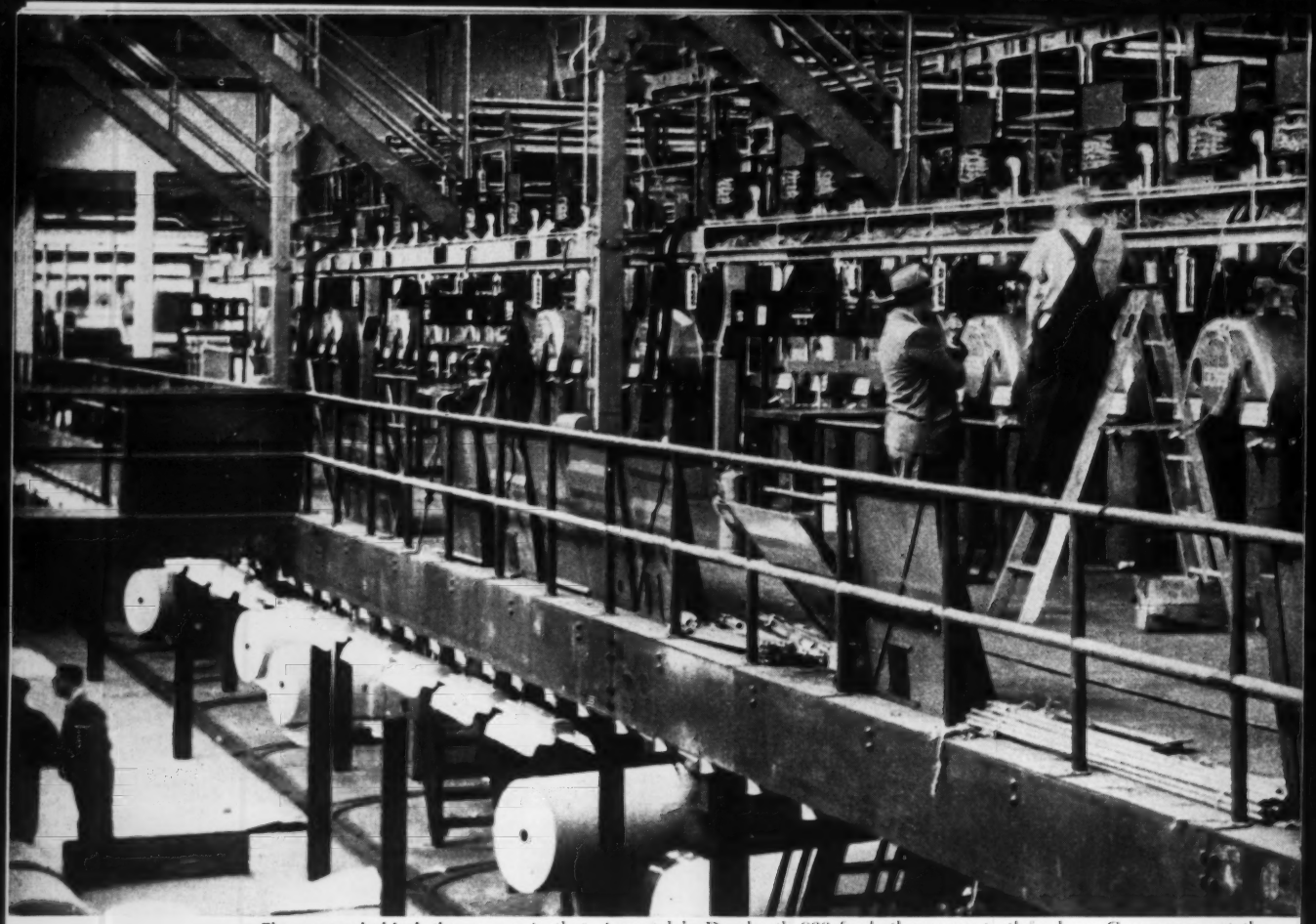
## Youngstown Sheet & Tube Building Annealing Line

Youngstown Sheet & Tube Co., Youngstown, has started construction of a second continuous annealing line as part of its tin plate expansion program at the No. 2 tin mill, Indiana Harbor Works, East Chicago, Ind. It will be in operation in about two years. Rated capacity: 60 tons an hour. The line represents an investment of more than $10 million.

Two buildings will be erected, providing 93,000 sq ft of floor space: One is for the annealing line and the other for coil storage. About 33,000 ft of piling will be required to provide solid footings for the buildings. They'll also require about 2665 tons of structural steel.

The line will be 560 ft long (including the 115 ft furnace) compared with the present unit which is 390 ft. At the entry end will be two reels, strip handling and cleaning equipment, and a 70 ft loop-

(*Please turn to Page* 122)



**The news behind the news**—is that Anaconda's Densheath 900 feeds the power to these huge Goss presses at the Chicago Sun-Times' new Fort Dearborn plant. Densheath 900's special heat-resistant insulation enables current to be car-

## AT THE CHICAGO SUN-TIMES

# An extra margin of safety and increased are provided by Anaconda's new

**Electrician laces in Anaconda Densheath 900** for a 50-hp press-drive motor. In addition to three master panels, each press has its own control panel.

Nothing "spoils" as fast as news. Thus, in a newspaper operation, there's no time for machine breakdowns, costly delays. The news *must* get out!

To see that it does—at the Chicago Sun-Times—Anaconda's Densheath 900 is on the job powering 30 giant Goss presses, plus teletypes, intercom systems, office equipment.

In *your* business, too, power failures can mean *serious* losses. Densheath 900 has the "*built-in*" *extra performance* your important circuits require.

Tough, flexible Densheath 900, then, deserves attention. This top-quality industrial wire is sound insurance against power failure. Here's why:

1 **LONG LIFE.** Consistently superior performance throughout the years under the severest operating conditions.

2 **HIGH HEAT RESISTANCE.** Can safely carry higher currents under exposure to higher ambient temperatures.

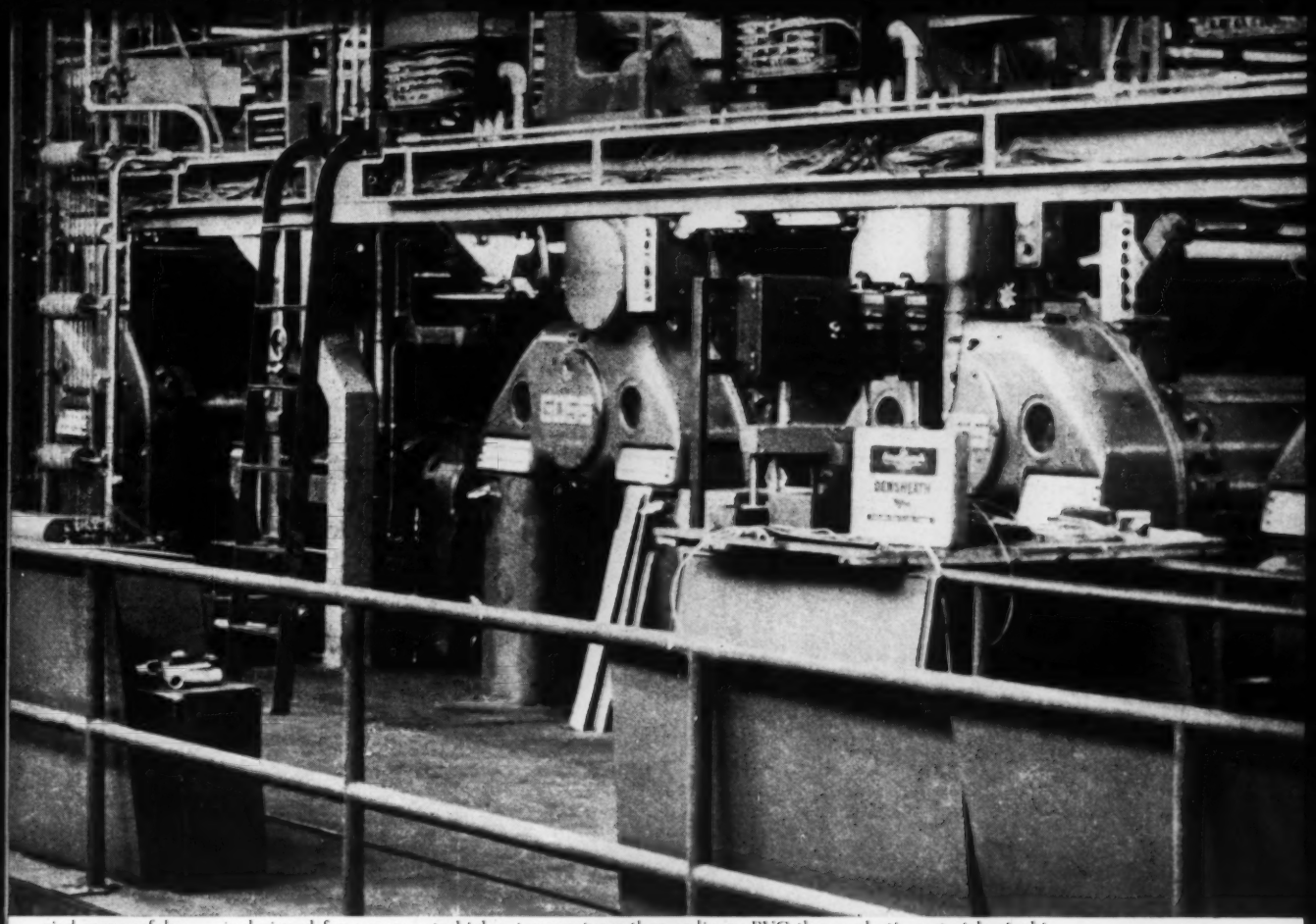
3 **CHEMICALLY STABLE.** Retains its electrical and physical characteristics despite exposure to cutting compounds, lubricants, most acids and alkalies.

4 **MOISTURE RESISTANCE.** The presence of moisture does not affect the satisfactory performances of Densheath 900.

5 **EASY TO INSTALL.** Flexible, easily formed, resists tearing, abrasion and stretching, strips easily.

6 **LESS "DRAG."** Coated with exclusive new "slipper" coat which offers less drag, greater resistance to scraping.

If yours is a plant now going to higher ambients, or higher temperature operations in corrosive atmospheres, Densheath 900 will be of particular interest. It provides an extra margin of safety for those "hot spots" which



ried more safely . . . is designed for exposure to higher temperatures than ordinary PVC thermoplastic materials. Architects for the new building were Naess and Murphy, Chicago. Electrical Contractor: White City Electric Co., Chicago.

# protection against power failures industrial wire—Densheath 900!

are always occurring . . . assures superior performance from your wiring. For contractors and distributors, Densheath 900 offers another advantage: it eliminates duplicate stocks, since the one wire can be used for building construction, appliance and machine tool applications. See the Man from Anaconda or your Anaconda Distributor about Densheath 900. Anaconda Wire & Cable Co., 25 Broadway, New York 4, N. Y. 58304

## RATINGS

The exceptional heat, chemical and moisture resistance of Densheath 900 enables it to satisfy the following:

- *U/L requirements for type TW*
- *ASTM D 734 Polyvinyl Insulating Compound*
- *90C Switchboard, Appliance and Machine Tool Wiring*
- *National Machine Tool Builders Association Specifications*

SEE THE MAN FROM **ANACONDA®**

FOR **DENSHEATH 900**

ANACONDA 900 DENSHEATH

## DENSHEATH 900

Densheath 900, the 90C industrial wire, is the result of more than 20 years of Anaconda's research and development in the field of thermoplastic wire and cable. Its specially heat-resistant insulation handles current more safely . . . it is designed for exposure to higher temperatures than ordinary PVC thermoplastic materials.

Underwriters' Laboratories Inc. Labeling: Type TW, Oil Resistant 60 C. Sizes 14 Awg through 4/0-Awg also labeled as Appliance Wiring Material for use at temperatures not exceeding 90C, or not exceeding 60C where exposed to oil.

FOR CRITICAL AREAS IN FURNACE LININGS:

# New, Porter Pitco-80... the only 80% Alumina plastic refractory on the market

Porter Pitco-80 is bagged in polyethylene material for maximum moisture retention and longest storage life.

- DENSIFIED DEAIRED SLABS
- PROPER WORKABILITY
- NEEDS NO FORMS
- FAST INSTALLATION
- FASTER HEAT-UP
- WITHSTANDS TEMPERATURES TO 3,200°F.

Now you can use a plastic refractory, with all the advantages of plastic, plus monolithic construction where you need an 80 per cent alumina refractory. New Porter PITCO-80 is recommended to: a) balance refractory linings in high temperature furnace installations . . . and b) for linings when iron oxides and molten aluminum are prime causes of failure. PITCO-80 alumina plastic is ideal for installation in:

**Aluminum reverberatory furnaces**
**Crucible furnace linings**
**Around electrodes in electric furnace roofs**
**Burner blocks**
**Desulfurizing forehearths and holding ladles**
**Boiler target walls**

For complete information write: *Refractories Division, H. K. Porter Company, Inc., Porter Building, Pittsburgh 19, Pa.*

REFRACTORIES PORTER DIVISION

H.K. PORTER COMPANY, INC.

PORTER SERVES INDUSTRY: with Rubber and Friction Products—THERMOID DIVISION; Electrical Equipment—DELTA-STAR ELECTRIC DIVISION, NATIONAL ELECTRIC DIVISION; Copper and Alloys—RIVERSIDE-ALLOY METAL DIVISION; Refractories—REFRACTORIES DIVISION; Electric Furnace Steel—CONNORS STEEL DIVISION, VULCAN-KIDD STEEL DIVISION; Fabricated Products—DISSTON DIVISION, FORGE AND FITTINGS DIVISION, LESCHEN WIRE ROPE DIVISION, MOULDINGS DIVISION; and in Canada, Refractories, "Disston" Tools, "Federal" Wires and Cables, "Nepcoduct" Systems—H. K. PORTER COMPANY (CANADA) LTD.

(*Continued from Page* 119)

ing tower to store 1600 ft of strip. Another 70 ft tower will be at the exit end for storing 1150 ft of strip.

## J&L Building Warehouse

Jones & Laughlin Steel Warehouse Div. is constructing a steel service center in suburban Cleveland at 16500 Rockside Rd., Maple Heights, Ohio. Cost: More than $1 million. When completed and equipped around Jan. 1, it will replace the division's present facility at 12875 Taft Ave., Cleveland. George L. Stewart is president of this division of Jones & Laughlin Steel Corp., Pittsburgh.

## Schedules Plant Opening

The new Anniston (Ala.) Div. of Anchor Metals Inc., Hurst, Tex., will begin partial production around Aug. 1. The firm designs and manufactures steel electrical transmission towers and switchboard structures.

## Enters Steel Casting Field

Goslin-Birmingham Co., Birmingham, has started manufacture of its own steel castings, in addition to gray iron. The company, a subsidiary of Commercial Credit Co., recently installed a 22 ton electric furnace. Previously, it purchased needed steel castings. The company makes specialized heavy machinery.

## Armco Expands at Butler

Armco Div., Armco Steel Corp., Middletown, Ohio, has begun a $17 million program for additional stainless steel facilities at its Butler (Pa.) Works. The project includes installation of new machinery and equipment and building improvements for a new unit to be known as Plant No. 2; and relocation of stainless steel production equipment from Plant No. 1 to Plant No. 2. Stainless steel melting, rolling, and some processing facilities will remain in Plant No. 1.

The project, to be completed late next year, will enable Armco to produce wider closer-tolerance stainless steel sheets and coils, says C. G. Davies, vice president-operations, Armco Div. Heavier coils also will be available.

The new facilities will include a

# *Savings match the load!*

You're seeing a Gerlinger Fork Lift Truck showing some of the remarkable stamina and stability that causes users to say, *"Our first choice is Gerlinger for the BIG JOBS!"*

What you can't see till you own one are the tremendous savings you gain. As you move more tons per hour . . . at much less cost . . . your profits increase in proportion. *Gerlinger* offers standard gas-powered, pneumatic-tired, *Job-Proved* fork lift trucks that handle as much as 40,000 pounds per trip. (Diesel engines optional.)

Want to see how savings match the load? Ask for Certified Job Studies covering your specific handling operations—and new Gerlinger Specifications Folder *GSS*. Write Towmotor Corporation, Cleveland 10, Ohio or Gerlinger Carrier Company, Dallas, Oregon.*

**TOWMOTOR**
*THE ONE-MAN-GANG*
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**-GERLINGER** LEADERS FOR 40 YEARS IN BUILDING FORK LIFT TRUCKS, CARRIERS AND TRACTORS

*Gerlinger Carrier Co. is a subsidiary of Towmotor Corporation

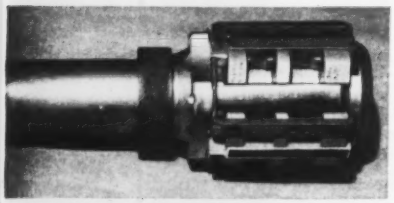
# WHY MICROHONING* TOOLS ASSURE

**ECONOMY — PRECISION — PRODUCTION**

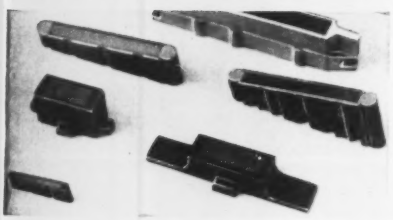
COST FACTORS (labor, maintenance, scrapped parts, productivity, etc.) DETERMINE MACHINE TOOL EFFICIENCY.

**To Minimize These Cost Factors,** Micromatic has developed Microhoning tools that offer a new concept in metalworking. This concept (known as the Microhoning process) assures controlled abrading, efficient stock removal, accurate generation of geometry and size, and produces uniform, functional surface finishes.

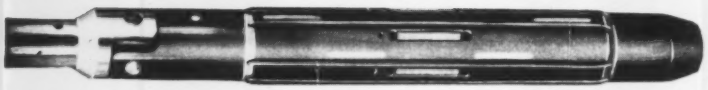
Because Microhoning removes inaccuracies of preceding operations, it is usually the final stock removal operation. Therefore, Microhoning tools are designed and applied to produce high precision, assure a minimum of scrap and protect the user's investment in previous processing operations.



New! Tru-Float tool has a universal joint within the abrading unit. This design provides maximum accuracy and float, uniform abrading and surface finish, less wear of abrasives, retention of original bore location, and minimum stock removal to correct inaccuracies.



Micromold assemblies have plastic or soft metal shells that minimize tool wear and protect the edges of abrasive sticks from the harsh dressing action of extremely rough bores. This abrasive stick design eliminates many parts previously required to hold abrasives and expand the tool.



Tool designed for Microhoning tandem bores has plastic guides between banks of abrasives to stabilize the tool as it passes over bore interruptions.

Because use of the proper tool is so important, Micromatic designs Microhoning tools to suit the individual work piece, and integrates tool design with machine and fixturing to provide the ultimate in operating efficiency.

*Registered U.S. Pat. Off.

**MICROMATIC HONE CORP.**

8100 SCHOOLCRAFT AVENUE • DETROIT 38, MICHIGAN


Sendzimir cold reduction mill, a rewind line, coil grinder line, an anneal and pickle line, and material handling facilities.

## Plans Research Center

Warner & Swasey Co., Cleveland, will construct a research center in Solon, Ohio. It will comprise 40,000 sq ft of floor space and is scheduled for completion by the end of this year.

## Master Lock Expanding

Master Lock Co. is constructing an addition to its Milwaukee plant. Cost: More than $300,000 for the building and $200,000 for machinery and equipment. The firm produces padlocks.

## ASSOCIATIONS

**American Iron & Steel Institute,** New York, re-elected officers and named C. M. White a vice president. Officers are: Benjamin F. Fairless, president; Max D. Howell, executive vice president; William M. Akin, A. B. Homer, and C. M. White, vice presidents; George S. Rose, secretary; E. O. Sommer Jr., treasurer; C. M. Parker, assistant vice president; and F. A. Coombs, assistant secretary. Two honorary vice presidents were named: John T. Whiting and C. F. Hood.

**American Iron Ore Association,** Cleveland, re-elected these Clevelanders to guide the group for the coming year: Herbert C. Jackson, Pickands Mather & Co., chairman of the board; Walter A. Sterling, Cleveland-Cliffs Iron Co., chairman of the executive committee; and Hugo E. Johnson, president. New directors are: C. H. Dewey, Republic Steel Corp., Cleveland; C. B. Jacobs, Inland Steel Co., Chicago; and R. Q. Archibald, North Range Mining Co., Negaunee, Mich. All other officers and directors were re-elected.

**Society of Reproduction Engineers,** Detroit, elected these officers: President, M. P. Myers, North American Aviation Co., Columbus, Ohio; secretary, W. J. Burdick, U. S. Naval Ordnance, Forest Park,

Ill.; and treasurer, W. M. Hanselman, Chrysler Corp., Highland Park, Mich. Vice chairmen are: Albert Prioletta, New York Port Authority, New York; H. E. Wilson, Oil Well Supply Div., U. S. Steel Corp., Dallas; and S. E. Enright, International Business Machines Corp., Poughkeepsie, N. Y.

## NEW OFFICES

**Campbell Steel Co.** opened its general sales office at 3323 Mercer St., Houston, under the direction of C. E. Praeger Jr., vice president and general sales manager. The firm has fabrication plants and steel service centers in San Antonio and Corpus Christi, Tex.

**Acme Industries Inc.**, Jackson, Mich., manufacturer of air conditioning and refrigeration systems, opened a direct factory sales office at 1485 Bayshore Blvd., San Francisco 24, Calif.

## CONSOLIDATIONS

Merger of **D. S. Kennedy & Co.**, Cohasset, Mass., and **Anchor Metals Inc.**, Hurst, Tex., has been proposed. If approved by stockholders, Anchor would be operated as a division of Kennedy. Anchor makes electrical transmission towers; Kennedy, large microwave antennas.

**Standard Steel Corp.**, Los Angeles, purchased **Cambridge Corp.**, Lowell, Mass., a subsidiary of Carrier Corp., Syracuse, N. Y. Cambridge manufactures equipment for the storage and transportation of liquefied gases at low temperatures. The firm also does defensework related to the missile program.

**Rockwell-Standard Corp.**, Coraopolis, Pa., purchased **Kerrigan Iron Works Inc.**, Nashville, Tenn., producer of lighting standards.

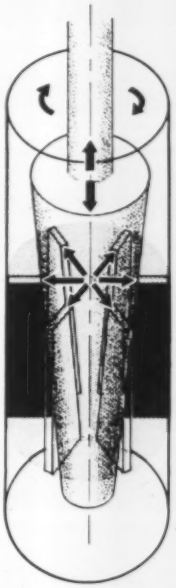
**Textron Inc.**, Providence, R. I., acquired **Schafer Custom Engineering**, Burbank, Calif., manufacturer of automation equipment for the

(*Please turn to Page* 128)


# HOW MICROHONING* TOOLS PROVIDE

**ECONOMY — PRECISION — PRODUCTION**

When a precision stock removal process minimizes cost factors (labor, maintenance, scrapped parts, etc.) then volume production at lower cost per piece is possible. Here's how the distinctive design and performance of Microhoning tools provide all three—economy, precision and production.



### EFFICIENT OPERATION

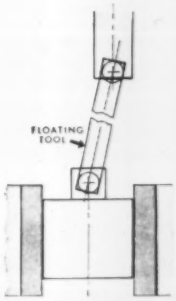
Micromatic expands, rotates and reciprocates the abrading tool in the bore. Through this controlled combination of pressure and movements, abrasives are self-dressing for effective and continuous cutting action. Long abrasive sticks are evenly spaced around the tool to keep it stable. They effectively bridge surface irregularities and generate a geometrically true cylinder.

### REDUCES OPERATOR COSTS

Micromatic "Adjusting Heads" give operator complete and positive control of tool expansion. Or, automatic controls can be used to perform all tool adjustment and gaging. They assure accurate duplication in every part produced.

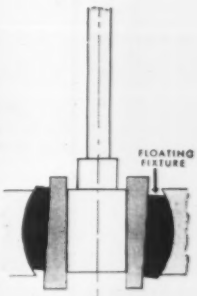
### MINIMUM MAINTENANCE

Micromatic tools are designed for durability, especially at all stress points and joints. Plastic or soft metal holders prolong abrasive life, greatly reduce tool wear.




### MAINTAINS ORIGINAL BORE LOCATION

Micromatic either floats the tool or the work holding fixture so tool and work piece can automatically align themselves. This assures cutting-unit rotation coincides with neutral axis of bore.




**WRITE FOR LITERATURE**

Micromatic produces tools best suited to the production of individual work pieces. And properly integrates the tool with machine and fixturing for peak productivity at lowest cost per piece produced.

**Registered U.S. Pat. Off.*

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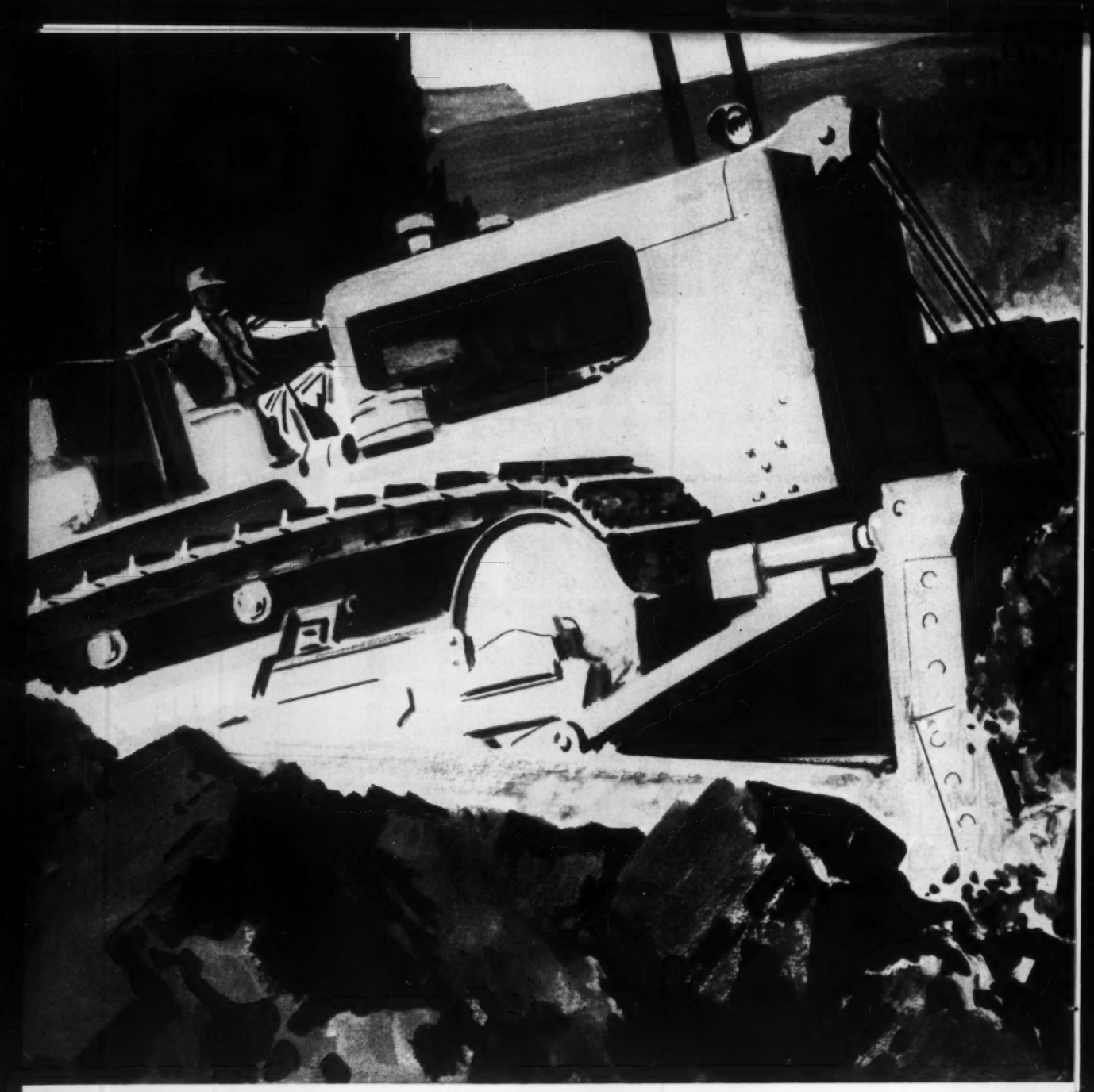


## Earthmoving muscles from tubes of steel

*A construction site springs to life as earthmoving equipment tugs, scoops, heaves and rips away at the earth's skin. It's grueling work!*

That burly dozer. It's precision built! It's strong! Its massive blade can tear the side out of a hill. Yet, it's nimble, too. In spite of a crab-like figure, it can stop with a jolt, back off, spin, dig in and charge with the force of a galloping rhinoceros.

Power is jammed into these machines. That's why they're built with the toughest, most durable materials in the world. For years, leading manufacturers have chosen USS Shelby Seamless Mechanical Steel Tubing for hydraulic cylinders, tractor pins, bushings and more than 100 other vital parts in earthmoving, rockmoving, grading

and all types of heavy mobile equipment. *Why?* Because Shelby Seamless Tubing is ideal for the fabrication of machine parts subject to bruising performance and long wear.

USS Shelby Seamless Mechanical Steel Tubing is another product from the world's largest manufacturer of tubular materials. For more than 80 years, National Tube has been foremost in building and industrial pipe applications. For more information, write to National Tube Division, United States Steel, 525 William Penn Place, Pittsburgh 30, Pennsylvania.

*USS and Shelby are registered trademarks*

**National Tube Division of United States Steel**

Columbia-Geneva Steel Division, San Francisco, Pacific Coast Distributors
United States Steel Supply Division • United States Steel Export Company, New York

**MAIN SHAFT FOR AUTOMATIC TRANSMISSION** *is finished fast . . . at low cost on this Osborn Power Brushing setup. In seconds—two brushing heads, using Osborn Economy wire brushes, oscillate back and forth and reverse direction to remove burrs and heat treat scale from splines at each end of the shaft. Brushing job is thorough and efficient to help assure troublefree shaft performance.*

# IN SECONDS

## with OSBORN Power Brushing

**What's your production problem**—higher volume . . . lower-cost output . . . better quality control? These are only *some* of the important basic problems you can easily solve—at low investment—with today's Osborn Power Brushing methods.

And you can *count* on the results—because over 67 years of experience means Osborn can engineer and apply the most efficient *power brushing techniques* for your specific jobs . . . your special problems.

The first step is an **O**sborn **B**rushing **A**nalysis. Here—your Osborn field engineer can single out immediate savings on your operations that involve deburring, cleaning, precision blending—or finishing methods of essentially every description. For details—write *The Osborn Manufacturing Company, Dept. S-9, Cleveland 14, Ohio.*

Osborn Brushes

OSBORN

POWER, PAINT AND MAINTENANCE BRUSHES • BRUSHING METHODS
BRUSHING MACHINES • FOUNDRY PRODUCTION MACHINERY


(*Continued from Page* 125)

radio and television industries. Textron is also acquiring **Randall Co.**, Cincinnati, producer of automotive specialty items, such as stainless steel trim and miscellaneous parts for appliance manufacturers.

## NEW ADDRESSES

**Mennel Milling Co.** moved its general offices to 128 W. Crocker St., Fostoria, Ohio.

**Gendron Wheel Co.** will move from its plant in Perrysburg, Ohio, to a site in Archbold, Ohio, about July 1. The company makes hospital equipment and wheelchairs.

## NEW PLANTS

**Gates Rubber Co.**, Denver, is constructing two $350,000 warehouses. One in Kansas City, Kans., will have 40,000 sq ft of space. Lyle Helwig will be in charge. The Portland, Oreg., facility will have 50,000 sq ft. It'll be under the direction of Bill Elliott.

**Jamison Steel Corp.**, San Francisco, opened a branch service center in Santa Clara, Calif.

**General Electric Co.**, Schenectady, N. Y., opened a facility at Paterson, N. J., for the manufacture of standard, fractional horsepower gear motors. Cost: More than $250,000. J. Stokes Gillespie is general manager of the firm's Gear Motor & Transmission Components Dept. at Paterson.

**Wheeling Corrugating Co.** is opening its metal culvert shop at Southampton, Pa. The firm is a subsidiary of Wheeling Steel Corp., Wheeling, W. Va. David L. Kendrigan is manager of Wheeling Corrugating's Philadelphia branch, which includes a warehouse, sales organization, and the culvert plant. L. P. Burke is superintendent of the Southampton shop.

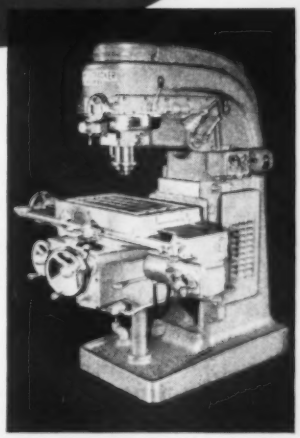
**Gorman-Rupp Co.**, Mansfield, Ohio, will build a 14,000 sq ft pump manufacturing plant at St. Thomas, Ont. Completion of the $100,000 project is set for mid-August.

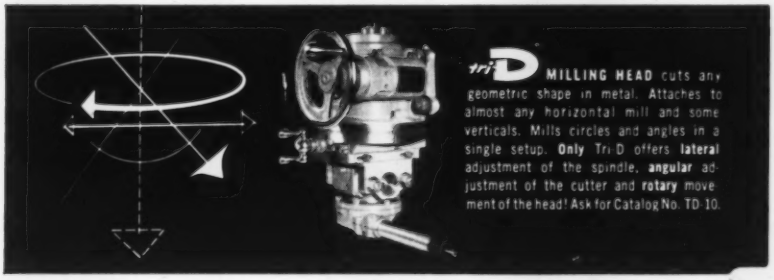
Die/namic Design
lets you
translate
blueprints into
metal in
one setup

Kearney & Trecker
MODEL D

# ROTARY HEAD MILLING MACHINE

Change job planning time into profitable production time! Simplify and speed close-tolerance milling of tools, dies, molds and parts having multiple radii — on Die/namic-designed Kearney & Trecker Model D Rotary Head Mill. It ideally combines precise mechanical control of spindle offset and rotary head motion, so that straight, angular and radial movements can be effected — all in a single setup. In production work, Model D eliminates jigs, fixtures, models and templates. For facts, see your nearest Kearney & Trecker representative or write direct.





**Tri-D MILLING HEAD** cuts any geometric shape in metal. Attaches to almost any horizontal mill and some verticals. Mills circles and angles in a single setup. **Only** Tri-D offers **lateral** adjustment of the spindle, **angular** adjustment of the cutter and **rotary** movement of the head! Ask for Catalog No. TD-10.

**AVAILABLE ON TOOL LEASE**

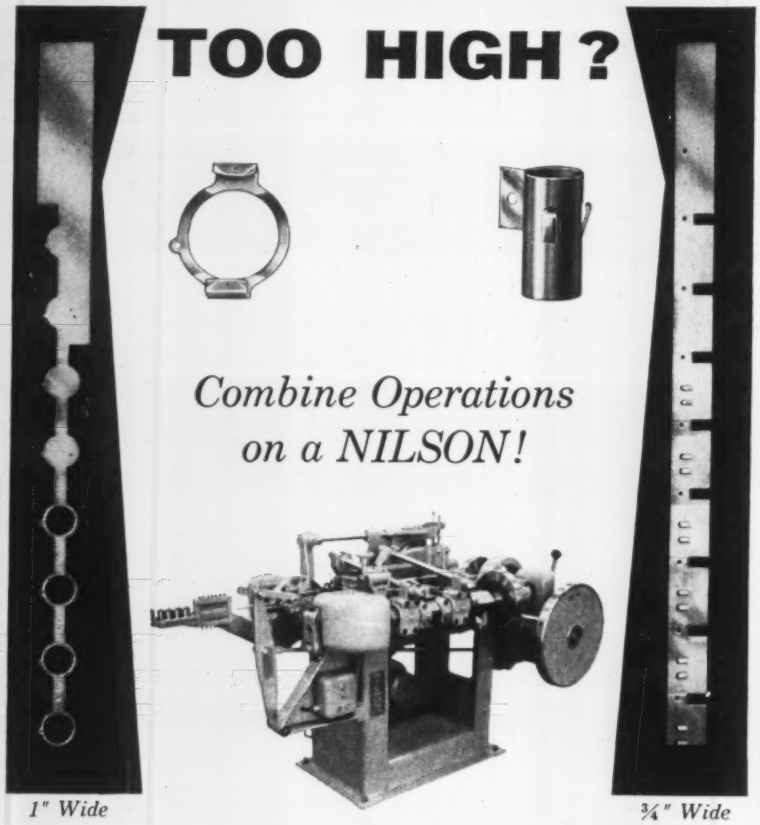
Conserve capital, reduce machine obsolescence — check into K&T's Tool Lease Program. Choose the machine you need from nearly 350 different standard milling and precision boring machines.

*DESIGNERS AND BUILDERS OF PRECISION AND PRODUCTION MACHINE TOOLS SINCE 1898.*

6790 W. National Avenue • Milwaukee 14, Wis.

KEARNEY & TRECKER MILWAUKEE

# STAMPING COSTS TOO HIGH?



*Combine Operations on a NILSON!*

*1" Wide* *¾" Wide*

Stamping costs soar when additional operations must be performed. But a Nilson 4-Slide with built-in press combines stamping *and* forming into one automatic operation . . . no secondary handling . . . ensures product uniformity.

The electronic component shown at left is made of spring-tempered Phosphor bronze, .010" thick. Specifications called for .0002" tolerances on critical dimensions —and allowed a total cumulative error of only .001"!

Solution: A simple progressive die and ingenious 4-slide forming tools are producing this piece at the rate of two finished parts per second. Production costs are substantially lower than if tooled for a conventional press.

With *nine* standard working motions available on a Nilson 4-Slide, production performance is limited only by the ingenuity of the tool designer!

If you produce wire forms or small metal stampings, Nilson's 4-slide forming techniques can point the way to lower costs. Send prints or sample parts for engineering recommendations.

Write today for the Nilson General Catalog on Automatic 4-Slide Equipment.

*Parts & production data, courtesy of Plaza Tool & Die Corp., Long Island City, N.Y.*

**NILSON**

THE A. H. NILSON MACHINE CO.

**605 Bridgeport Avenue • Shelton, Conn.**

AUTOMATIC WIRE & RIBBON METAL FORMING 4-SLIDE MACHINES • WIRE & STOCK REELS • WIRE STRAIGHTENING EQUIPMENT • AUTOMATIC STAPLE FORMING MACHINES • SPECIAL WIRE FORMING EQUIPMENT


*Coming July 13*

# Keeping Pace with Technology

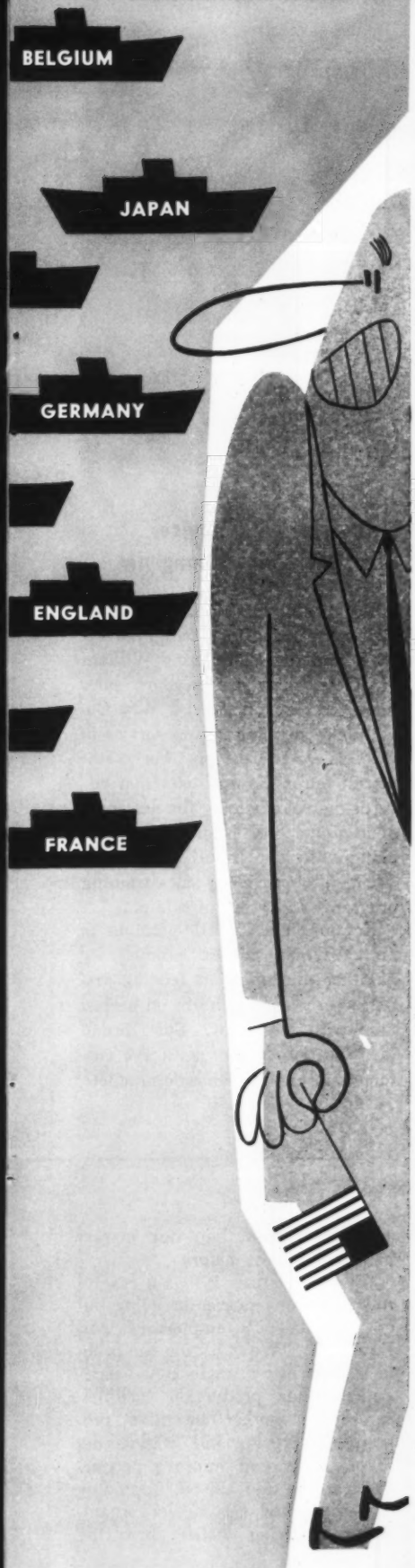
Superior technological improvements can go a long way toward pushing productivity higher and stemming inflation.

Are you taking advantage of explosive forming, chemical milling, numerical control—or any of the other new production techniques bursting forth in this Sputnik Age? The next article in STEEL's 1959 Program for Management will tell how you're missing a bet if you're not.

Articles in the series published to date:

1. **Profile of Metalworking's Managers (Feb. 16, p. 137).**
2. **Improving Productivity (Mar. 16, p. 103).**
3. **Keeping Wages in Line (Apr. 13, p. 95).**
4. **Giving More Public Service (May 18, p. 99).**
5. **Meeting Foreign Competition (June 15, p. 131).**

An extra copy of these Program for Management articles is available until the supply is exhausted. Write Editorial Service, STEEL, Penton Bldg., Cleveland 13, Ohio.




# Meeting Foreign Competition

FOREIGN COMPETITION is nipping hard at the heels of more and more metalworkers.

Only a few have been seriously injured. But the quickening contest for domestic and world markets portends more injuries—perhaps even some casualties.

Last year's export-import records point up the situation. U. S. exports dropped more than 14 per cent below 1957's, while imports declined less than 2 per cent. The impact in many segments of metalworking was far more severe. Imports scored amazing gains, while domestic firms fought a sales slump. (See chart, Page 134.)

Unquestionably, the major competitive factor is price, brought about primarily by the tremendous wage differential between domestic and foreign labor rates. Other basic competitive factors are also behind the trend.

The challenger is formidable. His production facilities—rebuilt in the postwar period—are modern and highly efficient. He often has surplus capacity for markets outside his country. Technologically, he has kept pace with us. He is producing well designed, high quality products with a good number of innovations, and he is displaying a lot of marketing knowhow both here and abroad.

What are you doing about it? A check of the import figures of your industry or those you serve (they're available from your Commerce Department field office) should indicate the urgency of your situation. Many metalworkers are already girding for the challenge—their activities may suggest ideas and approaches for you.

The task isn't easy. It runs the gamut—from political action, to basic competitive approaches, to go-

# Take Advantage of Your Yankee Knowhow to Combat Foreign Competition . . .

### New Product Design: First Line of Attack

Last month, Harley-Davidson Motor Co. entered the motor scooter field, a market well penetrated by foreign manufacturers.

"The foreign producers actually helped develop the American market," says William J. Harley, vice president-engineering. "When we decided to enter the market, we knew we had to come up with a scooter to compete not only in price but in style and performance."

These features helped Harley-Davidson reach its objective: Tubular frame construction; horizontally mounted motor, permitting better cooling without a fan; and an automatic transmission which is produced for 60 per cent less than the conventional three-speed type.

### Fight Price with Service, Other Marketing Intangibles

"Price is still the big factor in foreign competition in fencing, barbed wire, and nails," explains William H. Getz, merchant product sales manager, Keystone Steel & Wire Co.

"We're stepping up our service to wholesalers and dealers. For example, in our radio and television advertising we're helping the dealer by mentioning his business location along with our brand advertising. We're also providing sales training programs and point of sale aids."

Keystone adds a little glamour to an otherwise prosaic product by painting the top of its fencing and fence posts and the barbs on barbed wire with red paint. Such brand identification factors assist the customers in buying domestic products.

ing overseas. But, basically, it takes a realistic approach, a recognition of all the factors (we can't ignore our involvement in international affairs), plus hard work.

### Hit It from Every Angle

The experience and philosophy of William Davidson, president of Harley-Davidson Motor Co., Milwaukee, is a good example. "When the British devalued their money in 1949, they gained an overnight price advantage of 25 to 30 per cent over us," Mr. Davidson relates.

"By 1951, the pressure reached the point where we decided to go to Washington and seek relief from the Tariff Commission. After several months of negotiations—often tying up as many as 19 men—we lost our appeal and decided we were wasting our time. Imports kept gaining; more countries entered the market—Germany, Italy, Austria, Japan; and they began introducing more models of scooters and motorcycles than our market had ever known before.

"We knew then it was a case of rolling up our sleeves or going out of production," emphasizes Mr. Davidson. "We're hitting the problem from every angle now—modernizing our production facilities, revamping worker incentive programs, improving our engineering to cut costs and improve product performance and appeal, upgrading and expanding our dealer organization, offering better financing

### Push for Improved Depreciation Provisions

Depreciation reforms will help metalworking management meet the challenge of foreign competition, says Donald P. Else, comptroller, American Motors Corp.

"The biggest advantage of changes in our depreciation regulations will be to encourage manufacturers to invest in more automatic equipment that will save labor costs and enable them to compete against foreign prices."

What kind of depreciation does Mr. Else favor? "I think the declining balance method, where depreciation is greatest in the first year and smaller each succeeding year, advantages over establishing a new plant or settling up licensing arrangements.

### Buy American—Practice It; Sell It to Customers

Management should adopt a firm policy against the purchase of foreignmade products, believes D. W. Blend, general manager of Wolverine Tube Div., Calumet & Hecla, Inc.

His industry—copper fabricating—has watched its export business go tumbling while imports have skyrocketed.

In addition to its strong buy American policy, Wolverine is waging an active campaign to sell its customers on the same practice. The firm has prepared several booklets appealing to construction contractors, plumbing wholesalers, union plumbers, and all others who buy, handle, or install its copper tubing and other products.

### Join 'em To Protect World Market Position

"One of the best ways to maintain your percentage of world markets is to go overseas and operate under the same conditions as the foreign competitors," points out D. J. O'Connell, president of A. O. Smith International. "You not only obtain the advantage of their wage rates, but there are often tax advantages too."

His firm, like many other companies in the metalmaking field, is negotiating with several foreign companies and governments to set up joint operations.

Many executives feel that buying into foreign companies offers definite advantages over establishing a new plant or setting up licensing arrangements.

service to dealers and customers. Last month, we introduced a new product—our first entry into the motor scooter field."

As Harley-Davidson's experience suggests, there is no first or best starting point.

### Wages—the Big Handicap

The biggest apparent handicap is the wage rate differential. Some metalworkers view the current steel negotiations as the most critical to date. At stake: Inflation of the U. S. dollar and the increasing impact of foreign competition in domestic as well as world markets. Roger Blough, U. S. Steel Corp.'s chairman, highlights the competitive threat to the steel industry with these figures:

"Our nation's proportion of world steel production dropped from 54 per cent in 1946 to less than 30 per cent last year. The American employee, using our tools of production, turns out about 1.5 times as much steel as his German counterpart. But American pay and benefits amount to more than 3.5 times that of the German workers. The result: Unit employment costs are 2.5 times greater here than in Germany."

Brooks McCormick, executive vice president of International Harvester Co., points up this situation in his industry: "America's $2 billion farm equipment industry, long time leader in exporting, is rapidly turning into a major importer . . . in

# Foreign Metalworkers Gain in U. S. Markets

| Imported Product | 1954 | 1955 | 1956 | 1957 | 1958 |
|---|---|---|---|---|---|
| Wire Rods (net tons) | 39,849 | 47,762 | 64,192 | 54,369 | 181,283 |
| Concrete Reinforcing Bars (net tons) | 163,977 | 158,969 | 173,300 | 160,371 | 472,741 |
| Woven Wire Fence (net tons) | 10,436 | 13,136 | 21,991 | 30,135 | 39,671 |
| Brass Mill Products (millions of pounds) | 50.9 | 73.5 | 88.6 | 108.7 | 153.7 |
| Automobiles, New (millions of dollars) | $44.8 | $69.2 | $126.5 | $301.3 | $486.8 |
| Radio Apparatus & Parts (millions of dollars) | $2.5 | $3.3 | $8.4 | $15.3 | $28.1 |
| Typewriters (millions of dollars) | $5.5 | $7.7 | $12.7 | $16.9 | $19.6 |
| Electrical Machinery, Parts (millions of dollars) | $21.2 | $26.7 | $49.6 | $81.4 | $86.9 |
| Machine Tools (millions of dollars) | $22.3 | $16.2 | $24.6 | $36.3 | $28.1 |

Source: Department of Commerce.

the first ten months of 1958 over $16.5 million worth of tractor parts alone was shipped into the U. S.—$2 million more than for all of 1957. Exports of tractors and farm equipment dropped from $311.8 million in 1953 to $265.9 million in 1957.

"We calculate our gross average wages at $3.13 per hour, including fringe benefits. They compare with 75 cents in our French subsidiary, 74 cents in Britain, $1.09 in Australia, and 65 cents in Germany."

No metalworking executive is suggesting a wage cut. But those contacted by STEEL are urging that "this is the year to hold the line." Most metalworkers are highly complimentary of the steel industry's "hold-the-line" approach in today's negotiations. Commented the vice president of a medium-sized plant: "Big steel is in a good position to take a strike to make its hold-the-line policy stick. We'll back them up with a firm stand in our plant. But if they can't halt the wage spiral, certainly we smaller fabricators can't be expected to change the pattern."

## Opportunity Overseas

The drive to meet foreign competition in world markets has produced a real scramble overseas. Literally hundreds of metalworkers—from the giants down to some fairly small companies—are investigating opportunities in Western Europe, South America, Japan, and other areas.

Again, wage competition is only part of the problem. Compounding the domestic exporters' headaches are tariff barriers and dollar exchange problems. Most countries trying to boost industry exports give their firms better and faster financing terms than American companies. The European Common Market promises tariff changes which will make exporting to it increasingly difficult.

Most of the emphasis is on trying to establish joint ventures—domestic firms teaming up with foreign companies. Some foreign government regulations make the approach almost a necessity. It also has many advantages over establishing a wholly owned subsidiary. The chief ones:

1. It takes less capital.
2. In most cases, it causes less drain on the management manpower of the domestic company. Look for a firm with a record of good management, stress the experts.
3. The crossfertilization of ideas between their engineers and yours is a definite plus.
4. Relying primarily on "nationals" to operate the business right from the start has obvious public and government relations advantages.
5. Many foreign companies are eager for joint venture arrangements with American firms.

Warner & Swasey Co., Cleveland, recently joined hands with Asquith, a London tool builder. Walter Bailey, W&S president, says there's a growing market abroad for high capacity American machine tools, even though they're priced higher than European equipment. "We feel that in about three years we'll we able to sell machines for 30 per cent less than if we made them here in Cleveland and shipped them abroad."

Licensing foreign companies to make your products is also widely practiced. To many metalworkers, this has been an effective method of participating in markets that might not be easily available otherwise. A few executives report unhappy experiences — government regulations usually limit your fee or percentage; you're transferring your skill and knowhow for less than your resale commission; and unless your contract has teeth in it, the licensee might decide to terminate the contract and pick up where you left off.

## Really Know Your Market?

When was the last time you took a fresh look at your product and market? Part of the success of the foreign competitor has been in capturing a market largely being ignored by domestic manufacturers.

The small car is a good example. Certainly, American Motors Corp.'s George Romney did the marketing spadework. But many contend that foreign carmakers developed the market to the point where the Big Three are interested.

"Our sewing machine industry ignored the zigzag sewing machine when it was introduced in Europe," points out R. E. Isaacson, vice president of White Sewing Machine Corp. "The American housewife, we reasoned, differed from her European counterpart and was not interested in fancy stitching and embroidery. It didn't take long after the Italian-built Necchi machine invaded our domestic markets to realize our error."

Harley - Davidson officials are quick to credit the foreign scooter builders for helping to develop that market. "They introduced a little glamour into the product," says William Harley, vice president-engineering. "People who wouldn't consider riding a motorcycle found the motor scooter appealing. We watched the market for about five years before deciding to enter it.

"When we did, we knew we had to do two things to be successful: 1. We had to design a product to compete pricewise. 2. We had to come up with better styling and performance characteristics." Harley-Davidson engineers took advantage of as many competitive avenues as possible. A Fiberglas body was used because of more economical tooling costs. By mounting the motor horizontally, better cooling was obtained which in turn eliminated the need for a fan. One big advantage: Automatic transmission.

"Americans have shown that they are automatic conscious," explains Mr. Harley. "Europeans are not, and consequently most of their manufacturers provide only standard gear transmissions. We felt an automatic transmission would definitely be to our advantage saleswise. It also proved to be a good competitive feature in another way —it cost us less to produce."

Product innovation, of course, provides one of your best weapons

# Why Imports Are So Cheap

(All totals do not add up because some cost categories are not reported separately)

| Foreign Industry Costs | No. Lower than U. S. | No. Higher or Same |
|---|---|---|
| **Fabricated Metal Products (21)** | | |
| Unit Costs | 13 | 8 |
| Material | 7 | 14 |
| Labor | 20 | 1 |
| Overhead | 12 | 9 |
| **Machinery—Except Electrical (21)** | | |
| Unit Costs | 12 | 9 |
| Material | 6 | 11 |
| Labor | 12 | 5 |
| Overhead | 7 | 10 |
| **Electrical Machinery (13)** | | |
| Unit Costs | 6 | 7 |
| Material | 2 | 10 |
| Labor | 12 | 0 |
| Overhead | 8 | 4 |
| **Instruments, Related Products (9)** | | |
| Unit Costs | 4 | 5 |
| Material | 2 | 5 |
| Labor | 5 | 2 |
| Overhead | 4 | 3 |
| **Misc. Manufacturers(12)** | | |
| Unit Costs | 8 | 4 |
| Material | 7 | 4 |
| Labor | 7 | 2 |
| Overhead | 8 | 1 |
| **Other Manufacturers* (14)** | | |
| Unit Costs | 11 | 3 |
| Material | 6 | 5 |
| Labor | 9 | 2 |
| Overhead | 7 | 4 |

*Includes textile-mill products; leather, stone, clay, and glass; primary metal products; and transportation equipment. Insufficient data were reported to warrant separate treatment under Standard Industrial Classifications.
Source: National Industrial Conference Board, Study #61.

against domestic as well as foreign competitors. Research and development work is expensive, but many aggressive firms refused to cut such spending during the recession because it pays off. Bell & Howell Co.'s introduction of the automatic electric eye camera gave it a year and a half lead over foreign competitors which were chalking up large gains. B&H's sales last year were 13 per cent above 1957's—over 82 per cent of the sales represented products not being made five years ago.

Your greatest weapon in combating foreign competition in the domestic market is your marketing technique, emphasize most executives. Many also believe that this is the least developed activity in our business and industrial complex. Increased foreign competition could be the necessary stimulant to new concepts in marketing.

### You Have These Advantages

Take a look at your advantages today—particularly in industrial products. Proximity to the customer permits you to provide:

1. Better engineering service.
2. Better availability of parts and maintenance service.
3. Better financing arrangements.
4. Better training of the customer's personnel in the use of your product.
5. Better liaison with the customer to help solve his problems and to offer extra service during an emergency.
6. Better sales assistance if he's a dealer or distributor or if his product is a component.

Chain Belt Co., Milwaukee, had this experience with industrial and bicycle chains: "We lost practically all the bicycle chain business to foreign manufacturers," says O. W. Carpenter, president. "Price is the first factor. The absence of a need for service of any kind is the second.

"But we don't feel that industrial chains will go the same route. We've heard of some firms trying out foreign industrial chains, but most equipment producers value too highly top quality, part stocking, engineering assistance, and the other services provided by domestic producers to risk the price advantage. It's true, the foreign producers may develop the same types of services—if they do, their costs are bound to rise, and the price advantage will shrink."

Stepped-up emphasis on engineering services has also paid off for National Acme Co., Cleveland. "We're stressing the secondary operations in connection with our screw machines," Edward Ranney, assistant sales manager, points out. "Our sales engineers are assisting customers in solving cost problems by trying to combine such operations as flame hardening, cross-drilling and tapping, burring, and milling into continuous operations with our equipment."

### Sell Hard Overseas

Domestic firms are finding that their sales efforts must be upgraded to compete successfully in the export market. "The days of appointing a distributor, handing him a catalog and price list, then giving him your blessings are gone," laments one metalworker.

Foreign equipment builders are applying many of our best domestic sales techniques. They're visiting customers and distributors to learn their wants. Some German equipment builders use selling teams

*How it looks from the other side . . .*

# A European Views American Competition

*STEEL asked its European correspondent, Dr. Herbert Gross of Dusseldorf, Germany, to tell you how the European metalworker views his "foreign" competitor, the American. Here are his observations.*

**The relationship of European and American industry should be judged differently from now on. American firms are developing a kind of global division of labor with their development of supply sources here to export components back to America or to supplement their production by European specialties.**

**The advantage of production in Europe is partly based upon a different style of product for which large scale production has been developed here. Such products cannot be produced economically in the U. S. On the other hand, the lower wage rates in Europe are increasingly wedded with the most modern technology to enhance the advantage of our exports. At the same time, the European Common Market is transforming European industry from small scale to large scale production—resulting in additional productivity benefits.**

**Those things should not be judged in the antiquated term of cut throat competition but of a new international division of labor with many mutual branch plant building and licensing agreements on both sides of the Atlantic.**

**Europeans, incidentally, are concerned over American competition: Not of American exports to Europe but of American branch plants and arrangements with European firms manufacturing with U. S. knowhow.**

White Sewing Machine officials, Dodge E. Barnum (center) and R. E. Isaacson (right) confer with a representative of a Japanese firm on the design of a new machine

# White Sewing Machine Fights To Save a Traditional Name

**Foreign competition in the sewing machine market came in two waves:**

**1. About 1950, the Italian-built Necchi introduced zigzag sewing to American housewives.**

**2. Two years later, the Japanese brought in a machine comparable to American models but at a substantially lower price.**

**White Sewing Machine Corp., along with the other domestic producers, watched the Necchi to see if the new feature was a flash in the pan or whether Americans really wanted it. By the time the Japanese entered the market, the industry knew that foreign competition was more than a nuisance—it was a threat to survival. Imports rose from $17.7 million in 1954 to $28.3 million in 1957.**

**The near-fatal blow came to White in the spring of 1957 when it lost a contract with one of the major mail order firms which was taking about 50 per cent of its production. "We found ourselves in this predicament," relates R. E. Isaacson, vice president: "We had an excellent name (traditional in the sewing machine market), a reputation for quality, and a marketing organization. But we could not produce machines at a competitive price."**

**White solved its dilemma by going to Japan. It has arrangements with several manufacturers to produce sewing machines built to White's specifications. They are imported into White warehouses where they are inspected, electric motors are attached, and units are installed in cabinets.**

**How has the approach worked? "We expect to do a $20 million volume this year, compared with our peak domestic volume of nearly $31 million. Unitwise, sales will be about the same," points out Dodge E. Barnum, director of merchandising.**

**White officials are emphatic: "We are jealously protecting the White name and reputation for sewing machines. We'll maintain an engineering organization to keep working with the Japanese engineers in designing and building machines to meet demands of the American market.**

**"We feel our manufacturing arrangement has definite advantages over joint ownership in foreign plants. It keeps us flexible. We are in a position to move our production, if necessary. Conceivably, we might some day find it practical to produce again in this country."**

which include financing experts and technical people.

Warner & Swasey places specialists in foreign dealer organizations. They spend a year or two in the Cleveland plant training for such jobs. The foreign field is not a place to send recent graduates from apprentice programs, officials emphasize.

U. S. engineering knowhow is still in demand in the foreign market, and domestic firms are capitalizing on it in some installations of large, custom-built processing equipment.

Because of the high labor content in such work, American firms have been losing contracts to the foreign producer. Good example: The generating equipment purchased this spring by the Tennessee Valley Authority. A bid by an English firm was 50 per cent below that of General Electric Co.

To combat price competition in bids for foreign installations, some domestic firms have found it possible to work out combination deals with the government involved. Allis-Chalmers International did on a copper smelting plant project. It made arrangements with the French government (the installation was not in France) to provide the financing. Most of the manufacturing was to be done by a French firm. A-C International did the engineering, which was paid for in American dollars.

So A-C participated in a project which it probably would have lost otherwise. It also supplied some of the major equipment components to the French manufacturing firm.

Last month (May 18, p. 99), STEEL described industry's growing interest and participation in practical politics as a positive step toward improving the nation's business climate. Your ability to compete with foreign competition in both the domestic and world markets is affected substantially by government policy. The key areas are:

## 1. Tariffs

Tariffs and subsidies are repugnant to most metalworking executives. But several industries are being threatened, and many executives feel a tariff or quota system or some other sort of protection is a necessity.

The brass mill industry (through its Copper & Brass Research Association) made a detailed appraisal of the impact of imports on its products. CABRA figures show that domestic shipments of brass mill products have declined 33 per cent since 1955, while imports have increased 209 per cent. Imports of alloy seamless tubing in 1958 amounted to nearly 23 per cent of the domestic market.

CABRA suggests this approach:

- The U. S. should help foreign countries develop markets for their products in their own country or others where brass mill products are not made.
- Establish a flexible and changing

tariff system tied to foreign wage rates. As the foreign wage level increases and more nearly approaches that of domestic industry, the tariff would be reduced.

### 2. Investment Abroad

Laws to encourage industrial investment abroad are considered important by many executives.

Example: The Boggs Bill (H. R. 5) which is now before the House. It has these key provisions:

It would establish a new class of domestic corporation for foreign operations. Earnings would not be immediately taxable by the U. S., to permit expansion and further investment in overseas activities. Taxes would become due only when earnings are withdrawn from the foreign operation for distribution to stockholders or other use unrelated to the company's foreign operations.

### 3. Depreciation Reform

This is perhaps the most important broad area. Listen to A. F. Franz, president, Colorado Fuel & Iron Corp.:

"Foreign competition, in many respects, can attribute its remarkable growth to the rising costs in the U. S. We no longer have the superiority in facilities that for years permitted us to pay higher wages and still produce cheaper and better steel.

"In fact," continues Mr. Franz. "the smaller companies are in greater need of price relief than the larger ones because many of them have not had sufficient capital to modernize their plants fully.

"It is necessary for us to face foreign competition with improved equipment and lower operating costs. We cannot afford to price ourselves out of foreign and domestic markets if American jobs are to remain secure."

One of the major obstacles to depreciation reform by Congress: Industry people don't agree on what reforms are necessary. STEEL checked with tax experts and metalworking executives this spring to determine which approaches would best meet the needs of industry.

The editors narrowed them down to four basic approaches—they are outlined at left.

### Conclusion

Foreign competition is sure to get stiffer—both at home and overseas. It'll take all the ingenuity you can muster to combat it. You must have new and better products. You have to market them skillfully. You may have to go overseas. You must step up the pace to cut costs and boost productivity.

One constructive step that you can take immediately is to write to Rep. Wilbur Mills, chairman, House Ways & Means Committee. Outline the method of depreciation that best meets your requirements. Demand that action be taken. You will have taken a major stride toward meeting foreign competition.

*To get competitive with producers overseas . . .*

## You Can Take the First Step Today

**HIGHER PRODUCTIVITY has been the chief advantage domestic metalworkers have enjoyed over their foreign competitors. But U. S. mechanization has come in spite of, not because of, our depreciation laws which are the most archaic among industrialized nations.**

**With steadily rising costs in every sphere, American industrialists may have to curtail (if they haven't already) the vital modernization made unfairly expensive by federal tax depreciation policies.**

**See for yourself how vital modernization is from this National Industrial Conference Board study of comparative U. S. and foreign production costs:**

**Where the average capital invested per production worker in the U. S. exceeds $20,000, the domestic plant had lower unit costs than the foreign plant in more than half the products. Where the U. S. investment is less than $10,000 per worker, the U. S. plant has higher unit costs than the foreign plant in six out of ten products.**

**Industry favors four different approaches to depreciation reform, as revealed by a STEEL survey, Mar. 2, p. 69.**

**1. The bracket plan would classify assets into 10 or 15 general categories as in the Canadian system. Brackets of maximum and minimum useful lives would be given. You would be allowed to choose any useful life within the bracket without challenge.**

**2. The MAPI plan, developed by Machinery & Allied Products Institute, would retain the present concept of useful lives but allow a triple declining balance writeoff, or alternatively, a large initial allowance sufficient to get a similar result.**

**3. The reinvestment plan provides that when a property is retired you can deduct the difference between its value in current dollars and its cost at the time it was acquired. That amount, added to what was already written off, will compensate for the decline in the value of the dollar. The deduction would be allowed only to the extent than an equivalent investment is made within two years of retirement. The amount written off in the first year would be deducted from the depreciable basis of the new property.**

**4. The inital writeoff plan for depeciation reform could be enacted by changing a few words in Section 179 of the Internal Revenue Code. The section, made law in 1958, allows a taxpayer to write off 20 per cent of the cost of depreciable property if the deduction is taken in the year of acquisition and the cost of the property does not exceed $10,000. The reform would remove the $10,000 ceiling.**

**Congressmen point out one big reason why reforms have not been enacted: Industry's has failed to tell them forcefully and effectively about the need for change. A strong expression of industry's desire for reform can come if you write to:**

**The Hon. Wilbur Mills**
**U. S. House of Representatives**
**Washington 25, D. C.**

**He's chairman of the tax-writing House Ways & Means Committee. Additional help would be your indication of the kind of reform you prefer. It would answer another Congressional complaint: "Industry doesn't know what it wants."**

# *You are looking at 14 gold-plated garbage cans*

Special orders for the Texas-oilman trade? Guess again.

Fact is, each is priced *below* competition. The factory's turning out several thousand this month—for a new customer.

Unfortunately, the gold-plating doesn't show up on the product. Or anywhere else. It's concealed in a cloud of figures covering a month's operations for the whole factory. Weeks from today, somebody'll discover that the company lost money on the order . . . maybe even how *much* money. But now, the damage is done.

This story *could* have had a happy ending—with Automatic Keysort punched-card controls. A Keysort job-costing system could have computed a correct, profit-included selling price. The same system would have shown the plant manager how costs were running at each step of manufacture. He'd have spotted any impending loss *on time* . . . he'd have used his experience and know-how to eke out a profit.

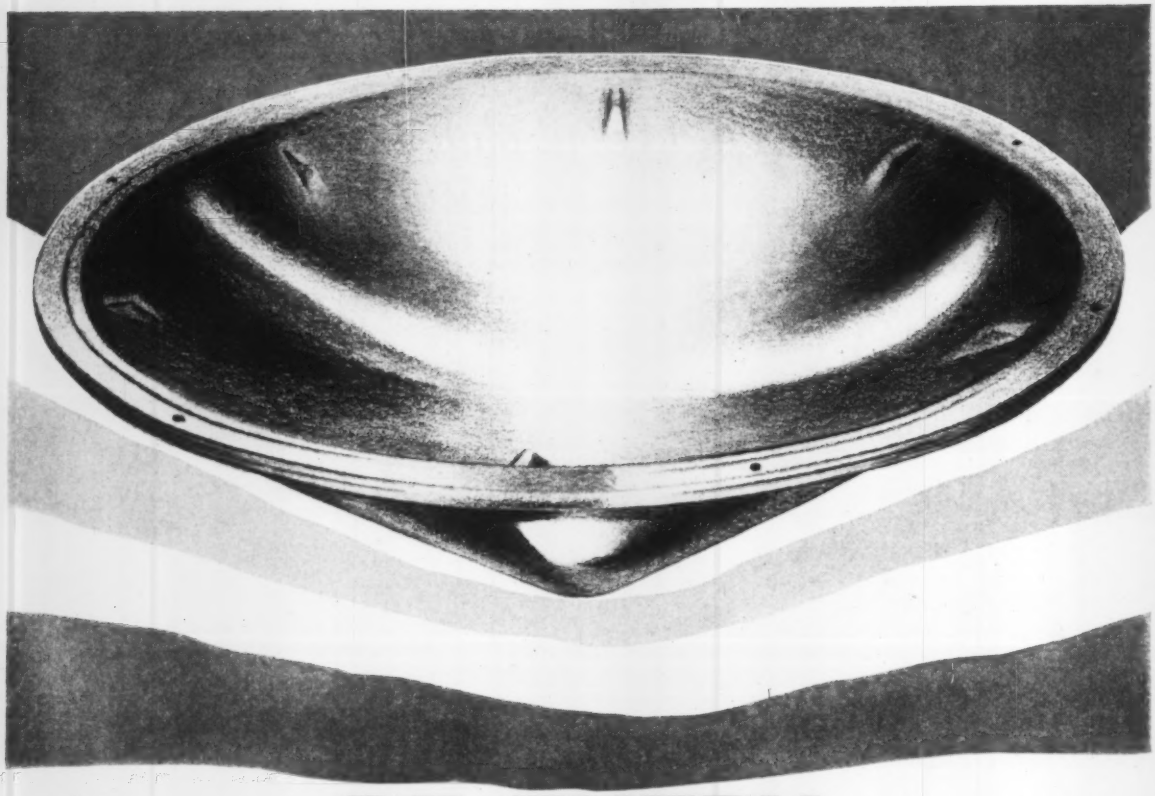
Automatic Keysort is today's only data processing system that provides a family of integrated machines and methods designed for the automatic creation and processing of original records. Speeding vital day-to-day and long-range facts essential to sound management, this unique system fits easily into your present operations...is highly flexible to future growth and expansion.

With the Automatic Keysort System, manufacturing concerns of every size can now enjoy fast, accurate data processing on either a centralized or decentralized basis. Without restrictive, complex procedures. Without specialized personnel. And at remarkably low cost.

Call your nearby Royal McBee Data Processing Representative, or write Royal McBee Corporation, Data Processing Division, Port Chester, N. Y. for illustrated brochure F-2.

**ROYAL M$^{c}$BEE** · *data processing division*

**NEW CONCEPTS IN PRACTICAL OFFICE AUTOMATION**



# RE-ENTRY SHIELDS

EST. 1883

WYMAN-GORDON IS FORGING RE-ENTRY SHIELDS

- Copper in production
- Beryllium in limited production
- Reinforced plastics in development

## WYMAN-GORDON

FORGING

ALUMINUM MAGNESIUM STEEL TITANIUM BERYLLIUM MOLYBDENUM COLUMBIUM
AND OTHER UNCOMMON MATERIALS

WORCESTER, MASSACHUSETTS

HARVEY, ILLINOIS
DETROIT, MICHIGAN
GRAFTON, MASSACHUSETTS
FORT WORTH, TEXAS
FRANKLIN PARK, ILLINOIS
LOS ANGELES, CALIFORNIA

**RUSSIAN TECH REPORTS**—Yttrium seems to reduce the grain size of many cast metals and improve their strength, say Russian metallurgists. The same source also predicts that rapidly expanding Soviet electronics will call for greater quantities of 99.999 per cent pure metals.

**SANDWICH AUTO BUMPERS**—Stainless clad mild steel is proposed for automobile bumpers by Allegheny Ludlum Steel Corp., Pittsburgh. Two year field tests have failed to pit, peel, or corrode the cladding.

**COLUMBIUM EXTRUSION BREAKTHROUGH**—Small percentages of tungsten, aluminum, vanadium, or zirconium make it possible to hot extrude two columbium alloys developed by Haynes Stellite Co., a division of Union Carbide Corp., New York. The alloys oxidize much less rapidly than pure columbium. Strength: About 40,000 psi at 2400° F.

**AUTOMATIC FLAW DETECTOR**— Pipes and tubes get a fast going over with a new ultrasonic flaw detector developed by the Southwest Research Center, San Antonio, Tex. It does not require operator judgment to classify flaws. A proposed miniature version could inspect buried pipe for signs of corrosion.

**SENSIBLE TEMPERATURE READING**— Portable electronic thermometers called Thermophils are said to be accurate within 0.1° F at room temperatures. Atkins Technical Inc., Marion Bldg., Cleveland, explains temperature is related to changes in the electrical resistance of a germanium alloy in the tip of a probe.

**STRENGTH THROUGH BUNDLING**—Several thicknesses of paper-thin steel sheets wrapped tightly on a mandrel produce a cylinder with an ultimate tensile strength of 305,000 psi. Ryan Aeronautical Co., San Diego, Calif., finishes the cylinder with a series of spotwelds and a resistance weld through all layers. The technique is being proposed for rocket engine cases.

**FLEXIBLE CAST IRON PIPE**— Ductile cast iron is the basis for a formable cast iron pipe made by American Cast Iron Pipe Co., Birmingham. It is made into tubing, casings, fittings, and special castings for water, gas, and chemical mains.

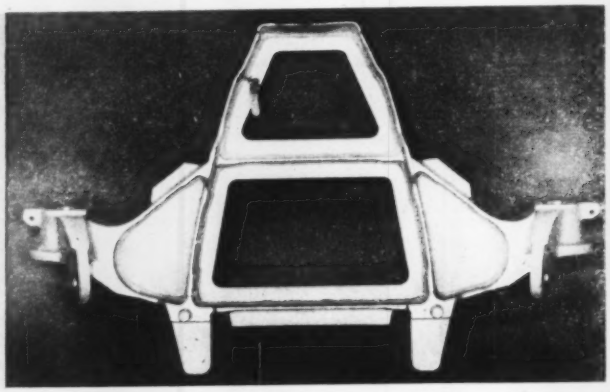
**TAPE REPLACES DIAL**— Where panel space is at a premium, you might consider using a narrow tape indicator developed by the Franklin Institute, Philadelphia. The tape is servodriven, can be several feet long, and color-coded to indicate acceptable, marginal, or dangerous zones.

**IT'S A SPACE TIRE,** not a wire brush. Goodyear designed it because rubber can't take the 2000° F heat generated during space flights and landings. Load deflection is similar to that of pneumatic tires and rolling resistance is higher, an advantage in braking and slowing. The wheel is being tested at the NASA laboratories in Cleveland

**HI-TEMP ELECTRICAL INSULATION**— The surface of copper and aluminum wire can be reacted with fluorine to produce a superior kind of insulation which is effective at 1100° F. Coatings resist repeated 90 degree bends.

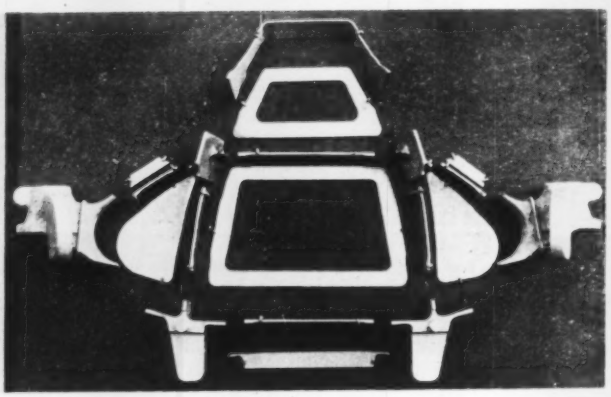
## How Would You Make This Part?

**This complex part posed a host of problems to its manufacturer. Should it be machined from the solid? Forged and then machined? How about fabricating it?**



## Here's How Rohr Did

**Engineers at Rohr Aircraft Corp., Chula Vista, Calif., took this way out. Their process combines standard shapes, special forgings, and welding to produce the high-strength part at minimum cost**



EVERY TIME a Boeing B-52G superjet bomber roars down the runway and hurls itself into the air, its eight mighty engines pull and strain against four 26 lb engine mounts.

The mounts, built at Rohr Aircraft Corp., Chula Vista, Calif., attest to the fact that the engineering choice between standard or special shaped materials can't be made by a toss of the coin, or by superficial estimate.

The Rohr design is the result of a variety of approaches tried by engineers and production men. It combines tailored forgings with sheets

Cost Crisis . . . How to Beat It

# Shaped Raw Material Can Mean a Head Start

**You may be able to trim the number of manufacturing steps or the number of parts used, or both. Also, a higher priced shape may actually result in lower material costs**

AN uninterrupted climb in manufacturing costs is sending many production men back to the product designers. The purpose: See if some manufacturing operations, or some parts, can be eliminated—or at least simplified.

Special shapes are bailing some of them out. One manufacturer, for example, switched from bar stock to extruded tubing to make valve seat inserts. He cut both the machining time and material costs and saved an over-all 19 per cent.

A door closer cylinder used to be assembled from three parts. Now it is made in one piece as an extru-

and bar stock. High strength welds make the combination pay off.

**• The first two ideas were discarded.**

Since the part must combine the properties of high strength and minimum weight, only the metal that contributes to load carrying can be tolerated. To machine this part from solid stock would have been tremendously costly and time consuming.

The next logical approach would be to start with a forging, then machine away the extra metal. The approach was considered. Rohr engineers calculated it would take a 62 lb forging to produce the part, and they figured the forgings would cost them about $106 each, based on 400 parts.

**• The part was made from 20 components. The method is some 20 per cent cheaper than others considered, yet it provides all the necessary properties.**

The engine mount is made from 4335 vanadium modified steel. The six forgings and 14 pieces prepared from standard sheet and bar stock are welded, using AWS 502 filler metal.

To get maximum weld properties, Rohr engineers specified butt-tension structural joints, moved away from the intersections far enough to allow welders to work efficiently. Forgings have protrusions along the line of intersecting members, so sound joints can be made.

The assembly was also designed so two members being joined are of comparable thickness. Shrinkage of the weld is also allowed for.

Some designers objected to weldments on the ground that welds were not strong enough. So Rohr's engineers beefed up the stock at the point of the welds, giving added strength with a nominal increase in weight.

**Rohr's W. D. Gore checks one forged "ear" on an engine mount that's installed in the B-52G pod**

After welding, the assemblies are heat treated to a minimum of 180,000 psi. Welds are examined by x-ray and must pass extremely tight requirements.

The net savings to the company is estimated at 20 per cent on each engine mount.

sion, eliminating several machining and assembly operations.

A forged turbine ring costs Ford Motor Co., Detroit, only a fraction as much as those it machined.

**• The trend is toward materials to lessen machining and forming.**

The problem of moving and removing large quantities has been pointed up dramatically in the aircraft and missile industries, where new materials defy economical production. But the problem is not limited to the makers of spacecraft. It belongs to all metalworking.

Convair's Thomas E. Piper, executive staff assistant, says the goal is for parts that are "born to shape." The object is to get rid of the heavy roughing work on parts—leave only the relatively simple and inexpensive finishing.

**• A word of warning: A decision you made two years ago on special shapes may be obsolete today.**

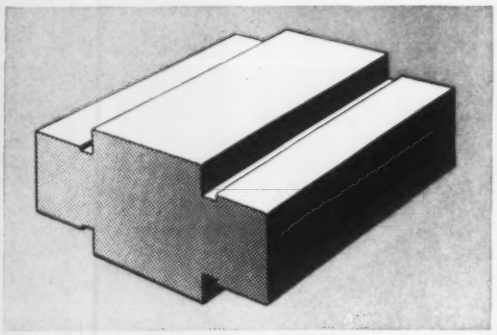
The technology of casting, forging, extrusion, powder metallurgy, rolling, and other processes has advanced enough to make re-evaluation advisable.

For instance, some production men still rule out castings for high strength parts, figuring they are good only for light to medium duty where tensile strength is important. Yet one of the country's leading foundries is turning out aircraft quality steel castings that have a 300,000 psi tensile strength, with up to 3 per cent elongation. That's good enough for most critical jobs.

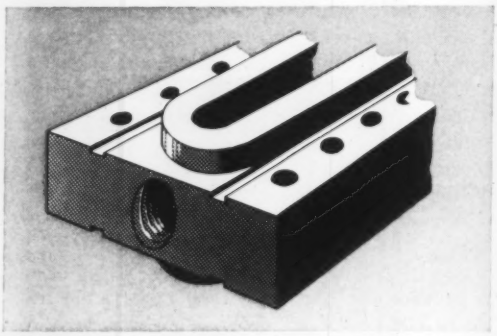
Another example: The general rule on steel extrusions is that no sections thinner than about 0.120 in. can be produced. Yet Convair has extruded sections as thin as 0.005 in. on its Dynapak machine.

**• You may be able to reduce the**

# Cold Drawn Sections Trim Gage Costs



**This sample section shows how cold drawing eliminated a straddle milling operation on each side**



**Finished parts are 7 in. to 10 ft long. Outside dimensions of the cross section are 2⅞ by 1½ in.**

ENGINEERS at Penberthy Mfg. Co., Detroit, have trimmed 7 per cent off the cost of the liquid chamber on one of their high-pressure gages, despite an increase in material cost—from about $2.14 to nearly $2.90 for each part.

Behind the over-all saving is a special cold drawn section that replaces standard rectangular bar stock. The shaped stock eliminates the need for straddle milling both sides of the piece—an operation that used to take as long as 1 hour 20 minutes on long parts.

• **Redesign Helps**—Because there must be no radius at the base of the raised face, Penberthy redesigned the part to accommodate cold drawing.

It permitted the vender to undercut the intersection so no machining would be required to get the sharp corner.

Penberthy buys the sections in 10 to 12 ft mill lengths from Republic Steel's Union Drawn Steel Div., Massillon, Ohio, and cuts them to part lengths on a friction saw. Machining operations include drilling and tapping ½ in. pipe holes at both ends, milling the longitudinal slot, cutting a radius on the ends of the raised face, and grinding the top face for flatness. Bolt holes are drilled along each side.

**number of production operations or the number of parts required.**

In an analysis of shaped vs. standard raw materials, first consider the parts on which you have to spend a lot of time. One expert feels that any time you have to remove more metal than you leave, you have a good bet for shaped materials.

An aircraft production man cited five parts (STEEL, Nov. 24, 1958, p. 102) where an average of 95 per cent of the raw material for each part had to be removed as chips.

He said: "We not only can't tolerate the loss of production efficiency, but the material waste is prohibitive."

Production men at American Bosch Arma Corp., Springfield, Mass., did away with some of their machining time on split clamping rings for diesel fuel injection pumps (STEEL, Aug. 18, 1958, p. 112). They switched from standard round stock to a hot extruded, cold drawn section provided by Jones & Laughlin Steel Corp. The only machining left is to slice off a part, cut 15 gear teeth, drill a hole, and mill a slot. The machining reduction is estimated at 22 per cent.

A missile launcher component for the Convair F-102 supersonic jet fighter used to be made from seven machined parts that were welded together. The component became a shaft with fittings on each end.

Now the part is made from a piece of processed tubing that has been closed at each end, and the end fittings are forged from the tube stock. Result: The one piece component is lighter, costs far less, and all of Convair's assembly operations are eliminated.

The door closer cylinder mentioned earlier is an example of a shaped part that will trim both the number of manufacturing operations and the number of parts. It used to be made from a three piece end fitting that was threaded to a piece of tubing.

Now the cylinder will be made from an impact extrusion, furnished by Mueller Brass Co., Port Huron, Mich. Each part comes as one piece, complete with end fittings.

At Newell Mfg. Co., Lowell, Mich., where the extrusion will be used on one closer model, President R. W. Hook figures the company can crop about 10 per cent out of its manufacturing costs by eliminating machining and assembly operations.

**• Material cost may be lower when you use a tailored shape.**

Take the company that used to make automotive parts out of round bar stock. The parts wind up as rings, roughly 2 in. in diameter. A pound of solid bar stock produced two drilled and bored rings. But a pound of the tubing substituted for the bar will yield as many as five rings. Even though the price per pound of the tubing is higher, the price per part is lower than with the bar.

Over-all material savings are estimated at 16 per cent.

**• Part of your decision on standard vs. special shapes will be based on the number of similar parts you have to make—but the volume theory isn't always valid.**

Take the complex steel hook-shaped part that had to be made for a Navy jet fighter plane. Production men were faced with the choice of machining each part from the solid, or of buying a forging. Cost studies showed that the complex contouring and tracing jobs needed to render the part from the solid would eat up all the money saved by not investing in forging dies.

An analysis proved that a production run of only 15 parts would be cheaper to produce from forgings than from the solid and that allowed for the amortization of the tooling at nearly $250 per part.

Investment casting is known as an eliminator of machining operations which is practical even where the runs are limited. One manufacturer trimmed a machining labor cost of about $5 down to only 50 cents when he switched from bar stock to a lost-wax cast part. All he had to do to the casting was drill two holes, avoiding seven different machining steps.

**• The design of a product is the greatest single influence on manufacturing costs.**

Design has to be a compromise between function of the end product and the cost for which you'd like to make it. The managers' best break is to get the lower cost with no sacrifice in function. Shaped parts may be an answer. In many cases you can buy the surface finish and dimensional tolerances you need on the finished part. Engineers at Allegheny Ludlum Steel Corp., Pittsburgh, claim hot extrusion tolerances of 0.031 in. for each inch of section thickness (up to 4 in.). They assert these can be halved by cold drawing.

Evaluation of alternate material shapes is part of the design job, and in many cases, cents spent here can crop dollars from the spiraling manufacturing costs.

## Enter the Competition

Your entry may be a winner in STEEL's second annual Cost Crisis Awards Competition which closes July 15. Tell us how your company beat the Cost Crisis through more efficient use of materials.

Four areas are being explored. Your entry may represent one, or a combination of them:

1. The substitution of a tailored shape for standard mill products, or vice versa.

Example—Dana Corp., Toledo, Ohio, saved 8 per cent on transmission mainshafts by switching from bar stock to die-formed shapes made by Republic Steel Corp.'s Bolt & Nut Div., Cleveland.

2. The use of a standard purchased material instead of a special, or vice versa.

Example—Hoover Co., North Canton, Ohio, used to buy close tolerance strip steel for vacuum cleaner tops. A switch to 19 in. coiled sheet saves 12 to 14 cents a unit.

3. Standardization of two or more separate purchases into one.

Example—National Acme Co., Cleveland, now specifies AISI 4615 for all steel parts to be carburized; three different alloys used to be purchased. One alloy, 4350, has replaced three others on a number of jobs. Result: Purchasing and inventory savings of about 10 per cent.

4. Direct substitution of one alloy for another of the same basic material.

Example—International Products & Mfg. Co., Chicago, trimmed rejects 10 to 15 per cent when it switched from heat treated 4140 and 8640 steels to La Salle Steel Co.'s Fatigue-Proof steel bars for generator and starter shafts.

Your savings may be in the cost of materials, or the cost of manufacturing. Write today for your Cost Crisis Awards kit. Address:

The Cost Crisis Editor

STEEL

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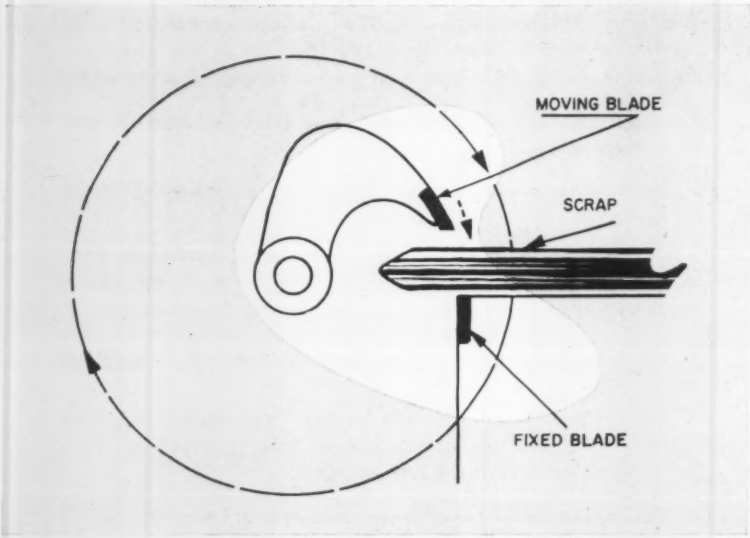
Cleveland 13, Ohio

# Charge Material Upgraded By Rotary Scrap Shear

**It makes a cut every 5 seconds; material isn't twisted, torn, or wedged, and there's no concentration of material at the blades. Cleaner scrap, cut in small pieces, is preferred as a charge material in steelmaking. Higher density makes for more efficient carloading**




WANT to produce high grade scrap for premium prices and more efficient carloading?

Clean, uniform, high density scrap is turned out by a rotary shear at Houston Pressed Steel Corp., Houston, says Sidney Byer, president. The shear was supplied by the Canton Div., Hill Acme Co., Cleveland.

**• It's a high tonnage machine, but the product rivals that processed by smaller, hand fed shears.**

The 60 in. shear is less expensive to buy and maintain than other machines of the same capacity, its makers claim. (Cost: About $120,000.) Operated by two men, it turns out premium scrap at a low cost per ton.

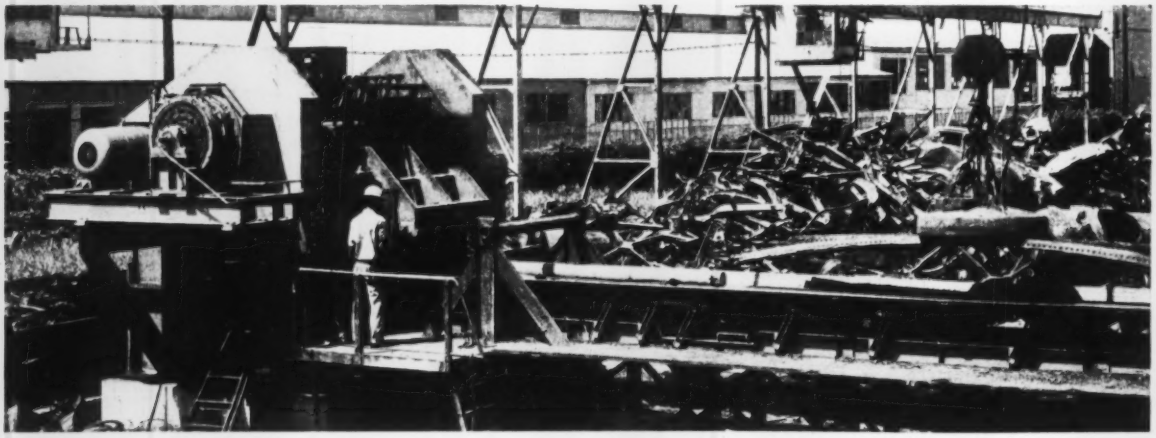
Long term operating figures aren't available, but the shear, fed by large cranes, is expected to cut more than 200 tons of scrap every 8 hours.

High speed cutting permits low scrap concentration at the blades, but the shear turns out high tonnage. It makes clean cuts, with no twisting, tearing, interlacing, or wedging of material. The product is similar to hand picked, hand fed scrap cut by smaller shears.

**• Scrap is cut by a heavy blade attached to a rotating drum.**

The stationary bottom knife is secured to the heavy steel base. The top knife is mounted on a cast steel drum, between two large gears. It can be installed with the drum stopped 180 degrees from closed position (the blade doesn't have to be held up while mounting bolts

**Vibrating trough conveyor feeds scrap, no matter how long, into the rotary shear. Stationary hold-down keeps out any pieces too large for the knife opening**



are tightened). Knives are available in one piece or in sections.

The drum makes a complete revolution every 5 seconds. Two heavy flywheels, mounted on opposite sides of the machine, insure proper balance for pinions and shafts.

Each flywheel is driven through a pneumatic clutch by a 50 hp electric motor. Clutches permit continuous or stop motion cutting. The drum can be stopped with an air brake.

When an overload occurs, clutches are released and motors are turned off automatically. The motors can be reversed to remove excess material.

**• The vibrating feeder conveyor permits easier separation of steel, nonferrous metals, and undesirable materials.**

Scrap is fed into the shear by an open, vibrating trough conveyor. Material can be aligned and sorted before it's cut. That makes for better scrap and longer blade life.

Continuous cutting is recommended; the material moves better when the conveyor is full.

A stationary hold-down takes the shock when long pieces are cut and keeps scrap from entering the shear if it's too large for the knife opening. Safety is insured by hydraulically operated, automatic hold-down shoes. Cut scrap is completely enclosed in the shear bed, eliminating flying material.

The Houston company elevated the feed side of the shear about 8 ft and uses a steel belt conveyor to load cut scrap in cars on a depressed track. Other systems can be used. Example: A small, vibrating conveyor could be used for sorting and loading cut scrap.

## Better Castable Offered

A tab-alumina castable refractory that takes up to 3500° F is announced by J. H. France Refractories Co., Snow Shoe, Pa. Called Hydrecon TabCast, it can be poured or cast after it's mixed with water.

The material has a crushing strength of 11,200 psi at 2500° F. It's said to show unusual resistance to corrosive furnace gases, extreme temperatures, and abrasion. Containing 93.66 per cent alumina and less than 0.1 per cent iron, it's useful in reducing atmospheres.

# King-Size Machine Does Precision Work

**Giant lathe handles parts 45 ft long and 105 in. in diameter, with a minimum of operator effort. It's controlled by push-buttons on the riding carriage**

DOING precision work on large assemblies? You may get some ideas from the giant lathe used at Aerojet-General Inc., Azusa, Calif. It was built by R. K. LeBlond Machine Tool Co., Cincinnati.

Called the Admiral, it's a two-bed type. It's 54½ ft long, 120 in. wide, and weighs 75 tons.

**• Designed to handle large, bulky assemblies, it will probably be used in making rockets.**

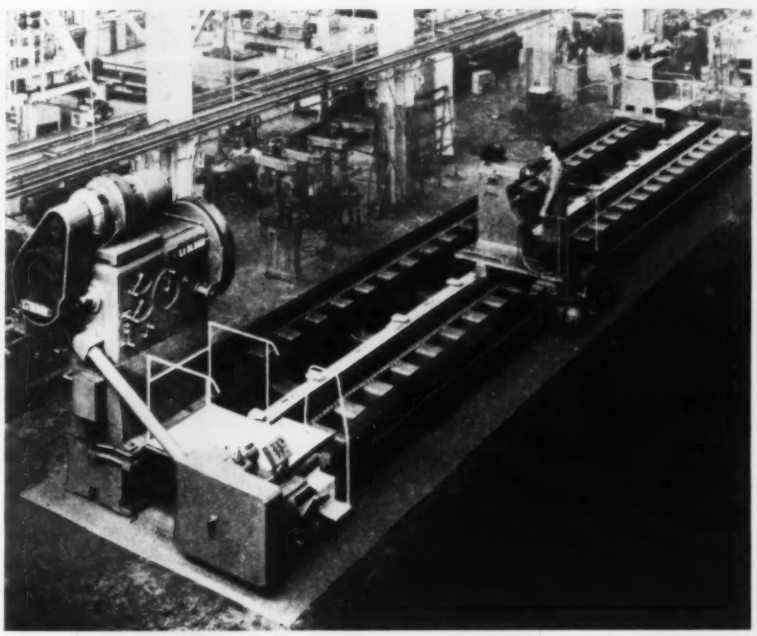
The lathe can be used for metal turning, but it will be used in other applications. (The company is prominent in the rocket field.)

It can handle a workpiece 45 ft long, with a diameter of 105 in. Spindle bearings can take a 50,000 lb load. Because many rocket parts are large but light, a 50 hp, variable speed motor is powerful enough to drive the lathe.

The machine has a full range of speeds (1 to 110 rpm) and feeds as low as 0.01 in. per revolution. The spindle is equipped with an electric brake for quick stops. Leads can be varied in microscopic steps.

**• The lathe is operated with a minimum of physical effort.**

Most of the controls, including remote ones for the headstock, are on the front of the carriage. The operator rides on the carriage, which runs on the front ways. Room for a second carriage is available for two-man operation.

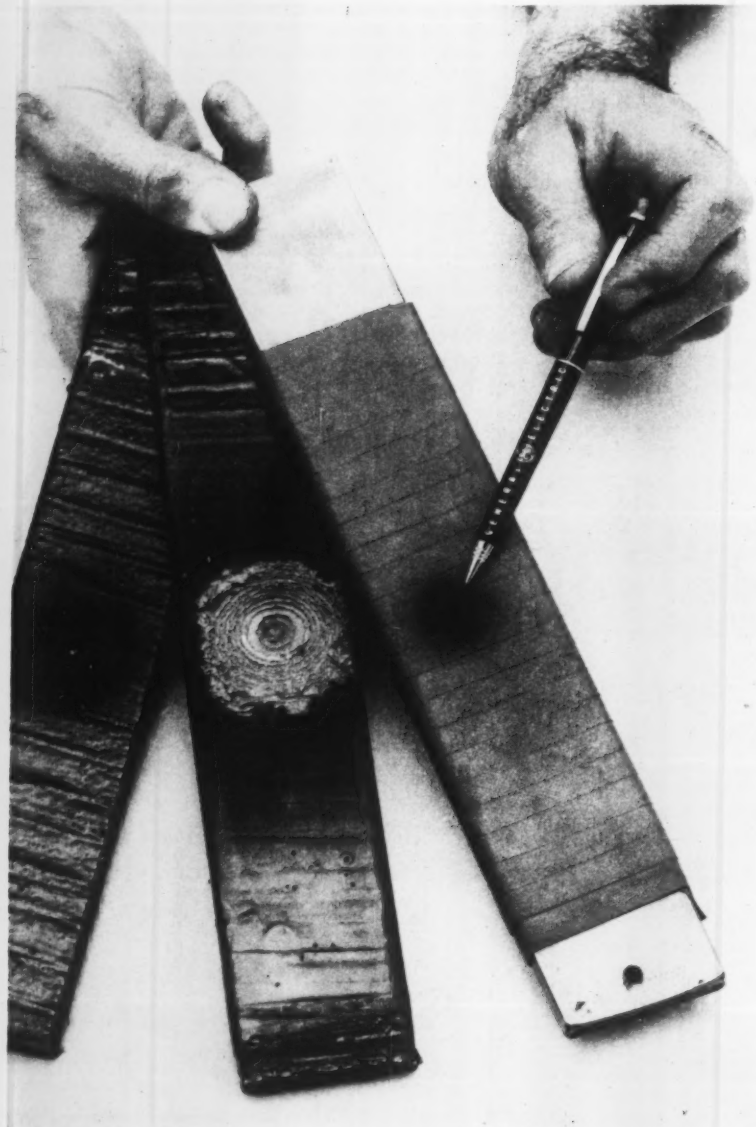


**Two-bed lathe is designed to handle large, bulky assemblies. It has a riding carriage and remote controls to reduce operator fatigue**

# New Insulation System Broadens Open Motor Use

**Silicone rubber impregnated tape is three times stronger than unsupported silicone rubber. It shows good resistance to high moisture areas, as well as certain abrasive environments**

**Abrasion test results: General Electric's new supported silicone rubber motor insulation (right) shows less wear than other types. Number 80 grit was applied to each insulated coil for 20 minutes at 40 psi, 2 in. away from the surface**



IF YOU use alternating current motors, take a look at the redesigned line made by General Electric Co., Schenectady, N. Y.

One feature, a new insulation system, means you can use less expensive, open motors where larger, totally enclosed types were required.

The supported silicone rubber insulating system is claimed to be 300 per cent stronger than unsupported types. Because of its high strength, the insulation can be thinner and dissipate heat faster. Voltage and thermal characteristics are outstanding. The insulation is rated Class B, but it has a Class F temperature capability and can operate successfully up to 482° F.

**• The motors can be used in certain damp, corrosive, and abrasive atmospheres.**

The insulation is effective against the effects of carbon black, flying chips and dirt, chemicals, fly ash, and moisture.

Form wound coils are given a consistent buildup of fiber supported insulation tapes. The entire coil is vulcanized to bond the tapes and provide a single, uniform dielectric wall around the coil. Bonding keeps out contaminants.

**• Each layer of insulation (called Polyseal) contains Dacron and glass supporting fabrics.**

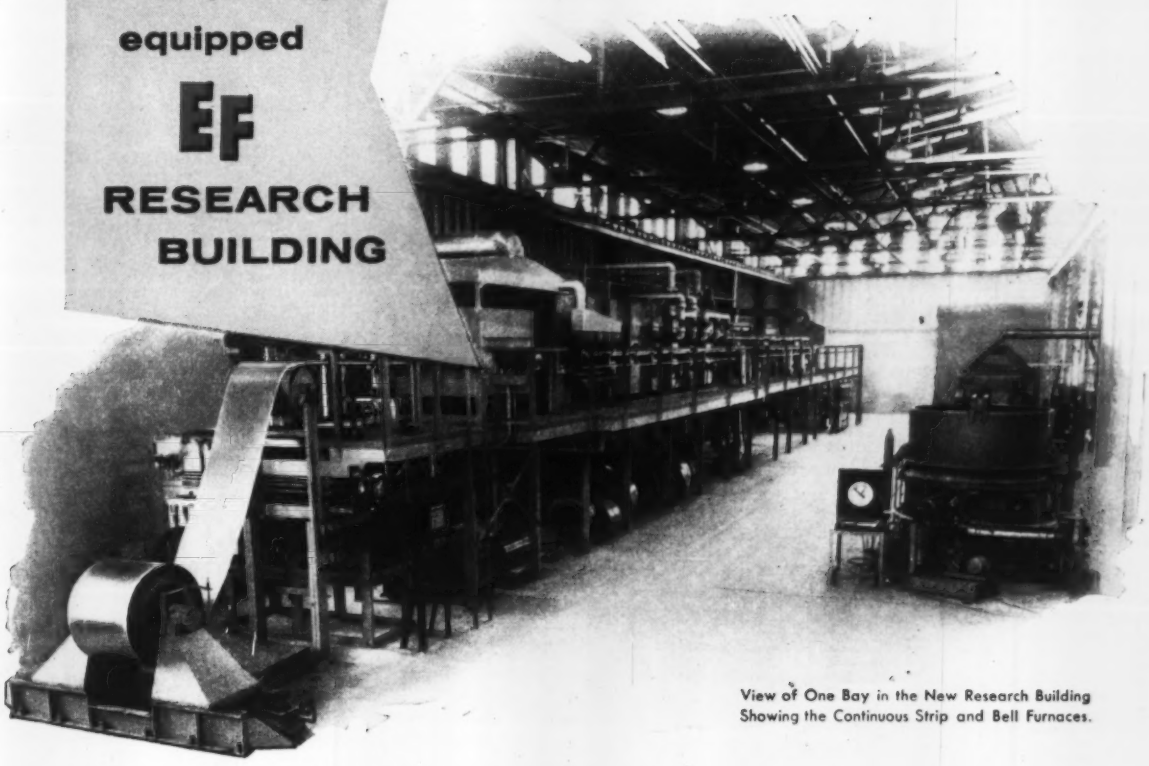
Polyseal prevents cut-through and fracture of the silicone rubber. It also helps prevent rubber migration or flow. A special silicone rubber compound placed beneath the lead stops contaminants from entering the coil. When the coil is vulcanized, this compound seals the lead tubing to the silicone rubber coil coating.

Silicone rubber seals all connections and motor leads after the coils are inserted in the stator and the connections have been brazed. The completed stator undergoes a final baking which vulcanizes the silicone rubber on the connections to provide a completely sealed system.

**• The new supported insulation has high abrasion resistance.**

In a test using standard sandblast equipment, the material was essentially undamaged. Other commonly used insulations were cut through to the coil. Number 80 grit was applied for 20 minutes at 40 psi, 2 in. from the surface.

# New completely equipped EF RESEARCH BUILDING



View of One Bay in the New Research Building
Showing the Continuous Strip and Bell Furnaces.

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From these new facilities will come improved techniques for treating familiar materials, and new techniques for treating the newer metals of the jet and space age;— also expanded testing of critical materials used in our furnaces, to maintain our unsurpassed standards of quality and performance.

As in the past, our research facilities will be available to metal producers and processors, for development and test work, conducted, if desired, in the presence, and with the assistance of your own technicians and production men.

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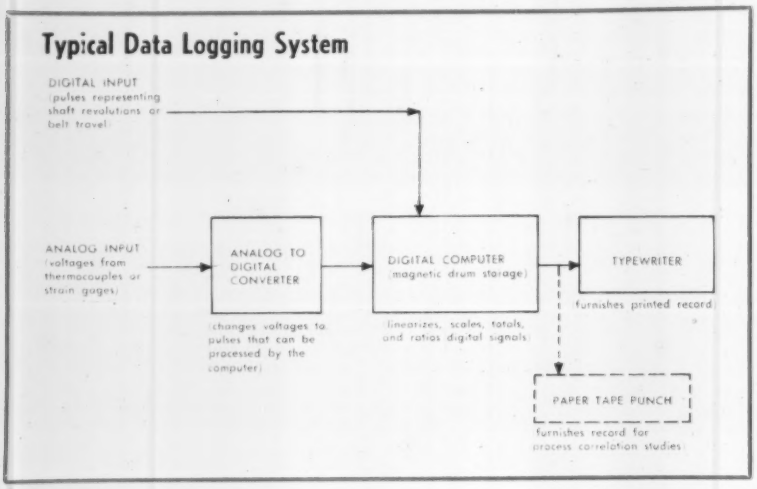
# Steelmen Try Automation In the Sintering Process

**Wanted: Higher tonnage and better quality sinter for blast furnace charge. Increased use of sinter is boosting blast furnace productivity and lowering the coke rate. Mix proportioning is the first step toward automation of the sintering process. Next: Data logging and process correlation studies**


Typical Data Logging System
DIGITAL INPUT (pulses representing shaft revolutions or belt travel)
ANALOG INPUT (voltages from thermocouples or strain gages)
ANALOG TO DIGITAL CONVERTER
(changes voltages to pulses that can be processed by the computer)
DIGITAL COMPUTER (magnetic drum storage)
(linearizes, scales, totals, and ratios digital signals)
TYPEWRITER
(furnishes printed record)
PAPER TAPE PUNCH
(furnishes record for process correlation studies)

By J. E. ORAM
Industrial Engineering Section
General Electric Co.
Schenectady, N. Y.

LOOK for increased use of process control equipment in sinter plants.

Here's why: High grade ore reserves are dwindling. Low grade ores must be beneficiated and agglomerated for use in blast furnaces. Other benefits: Greater productivity and efficiency.

**• Automation is often used in the raw material system feeding the sintering machine.**

The proportioning system blends several types of ore with other raw materials to feed the sinter strand. Total flow depends on the desired burn-through point. If sinter bed burn-through is too early, flow of sinter mix is automatically increased; fuel, mill scale, cold fines, and other ingredients are automatically regulated, maintaining a preset ratio of the various materials to the ore input.

After the burn-through detector calls for a material flow increase and a predetermined transport time has elapsed, a bed level detector on the sinter machine senses the increase. Machine speed is automatically boosted to maintain the correct bed level. Higher speed moves the burn-through point nearer the end of the strand.

**• More must be known about sintering before complete process control is possible.**

Closed loop control, such as regulation of the burn-through point and bed level, is in limited use. Controlling metallurgical and chemical relationships must be better understood before the sintering process can be controlled automatically to produce sinter of predetermined quality.

Many variables are involved; a great amount of data must be recorded rapidly, in a form easily reduced, studied, and correlated. The answer: Data logging equipment.

**• A typical system would collect process data and turn out a typewritten and punched tape record.**

An installation slated for operation in 1960 is to record 64 points of data at 5, 15, 30, or 60 minute intervals. Analog inputs will represent such things as conveyor speed, temperatures, composition of raw materials, material weight and flow, drafts, speed, burn-through point, and bed level. The system can be expanded to handle additional signal inputs as necessary to gain complete understanding of the process.

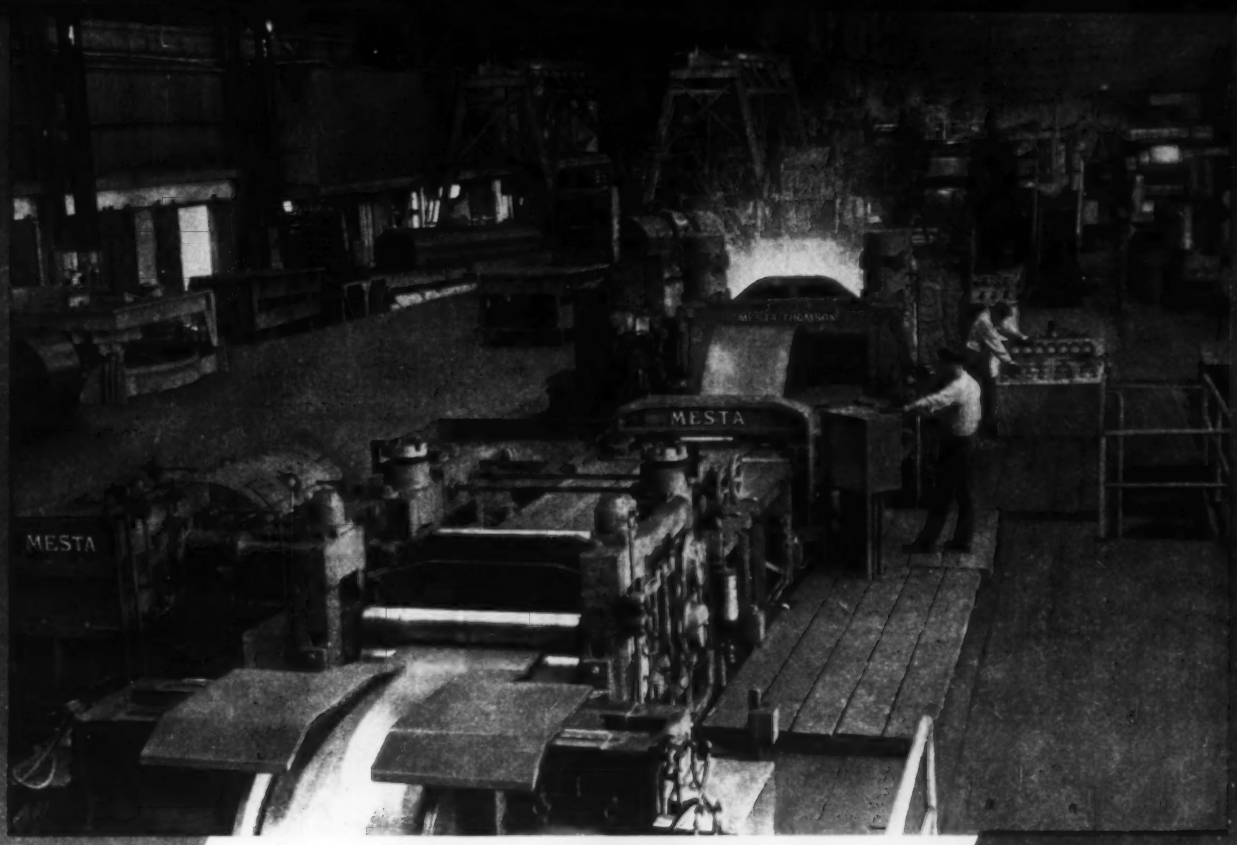
A digital computer, with magnetic drum storage, does all the linearizing, scaling, totalizing, and ratioing. Computer output is printed by an electric typewriter. Punched tape output, for process correlation studies, is also provided.

When selected inputs are outside preset high or low limits, an off normal alarm sounds, and the data logger scans all points, printing off normal readings in red type.

**• The system will permit better record keeping in the sinter plant.**

Production statistics will be totaled at the end of each shift. Example: Signals from the conveyor belt scales will go into temporary storage for integration and totaling every 8 hours, providing a production report. Optional: A multichannel trend recorder that could be connected to any combination of analog inputs.

As process information from the system is studied and correlated, it may be necessary to record more than 64 points of data. Modular design will allow analog and digital inputs to be increased as required, and as more process sensors become available.




MESTA 48" Continuous Pickling Line with Primary and Secondary Processors, Flash Welder, Up-Cut Shears, Side Trimmer and Up-Coiler.

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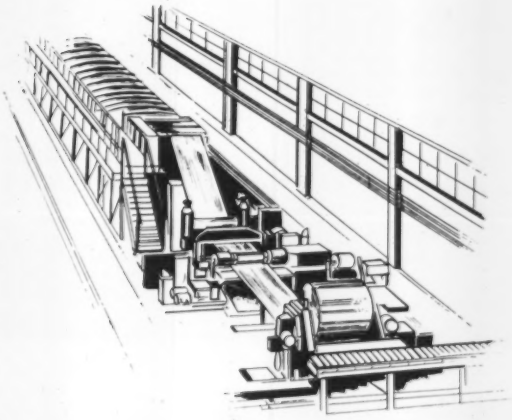
# MESTA



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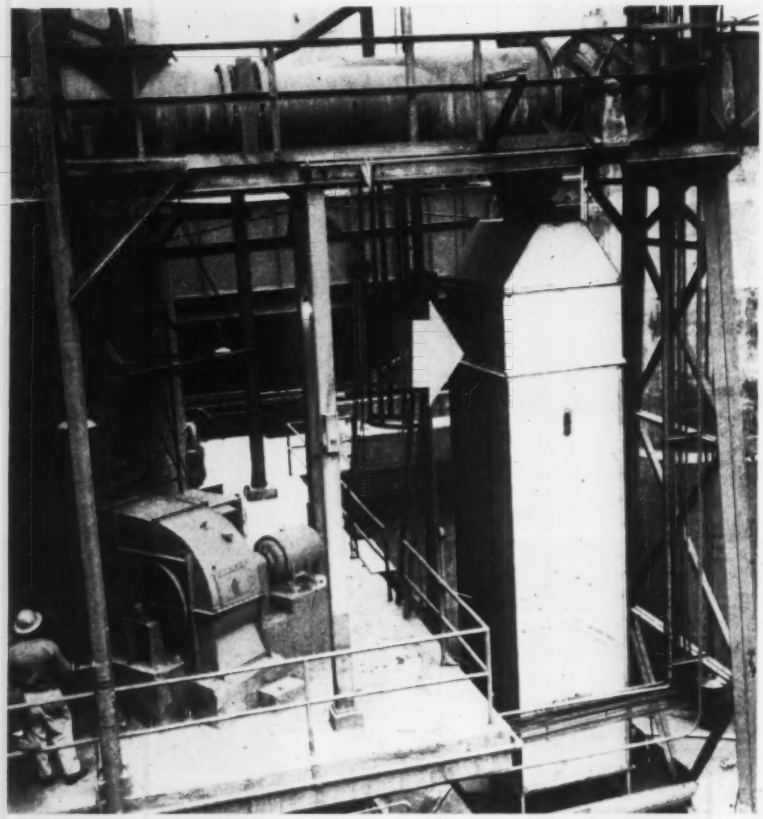
# Here's How to Muffle Blast Furnace Noise

**Snort valve silencers installed at Kaiser Steel prevent hearing injuries to employees; they also improve plant efficiency and aid community relations**



**Silencer, suspended from the snort valve outlet, absorbs blast furnace roar**

INDUSTRY is doing its best to silence objectionable noise. Example: Snort valve silencers muffle blast furnaces at Kaiser Steel Corp., Fontana, Calif. The units were supplied by the Sound Control Dept., Koppers Co., Inc., Baltimore.

**• After testing one unit, the company decided to buy two more.**

Kaiser considered noise suppression good business. Employees suffer hearing loss when they're exposed to high level noise over a long period. Plant efficiency and community relations are also affected.

The company installed a silencer on one furnace and tested it thoroughly.

When noise was reduced to an acceptable level, similar units were installed on two other stacks.

**• Noise is absorbed by a mass of metal wool.**

Each silencer, suspended from the snort valve outlet flange, weighs 8000 lb. The steel shell, 24 by 6 by 6 ft, is filled with spun metallic wool. A face sheet of glass fiber and a face plate of perforated, galvanized steel separate the metal wool from the shell.

## Manganese Wrought Iron Resists Impacts When Cold

A new specialty wrought iron has been developed for use as an economical, impact resistant metal for low temperature design. It can outperform many steels, says A. M. Byers Co., Pittsburgh.

The material is intended for applications in the petroleum, chemical, and refrigeration industries and others in which brittle failure is giving trouble. Impact properties are good at subzero temperatures. The company says that excellent corrosion resistance, weldability, and working properties have been shown in laboratory tests.

The alloy is designated Mn wrought iron after its principal alloying element, manganese. It's a highly deoxidized wrought iron, with lowered phosphorus and carbon content, alloyed with about 1 per cent manganese.

Mn wrought iron pipe made by the company will be marked with a gold colored band 1 ft from each end. Plates and other flat rolled products will be similarly marked.

## Permits Vacuum Pouring

A vacuum degassing system that permits top or bottom pouring of single steel ingots has been developed by Blaw-Knox Co., Pittsburgh. The assembly includes a 10 ton transfer ladle, a vacuum hood, a replaceable spout, and adapter flanges for 36 or 48 in. molds.

For top pouring, the ladle is set on the hood, which is then sealed to the top of the mold with an O-ring. For bottom pouring, a special plate seals the ring at the top of the hood.

## Improves Ladle Additions

Ladle additions are made faster and more accurately with a new feeder system at National Works, McKeesport, Pa., National Tube Div., United States Steel Corp.

The system, designed by Blaw-Knox Co., Pittsburgh, makes additions in the tapping stream from a tilting, open hearth furnace. It uses electronic weighing and a 12 speed, vibrating conveyor to deliver up to 4500 lb of ferromanganese per minute.

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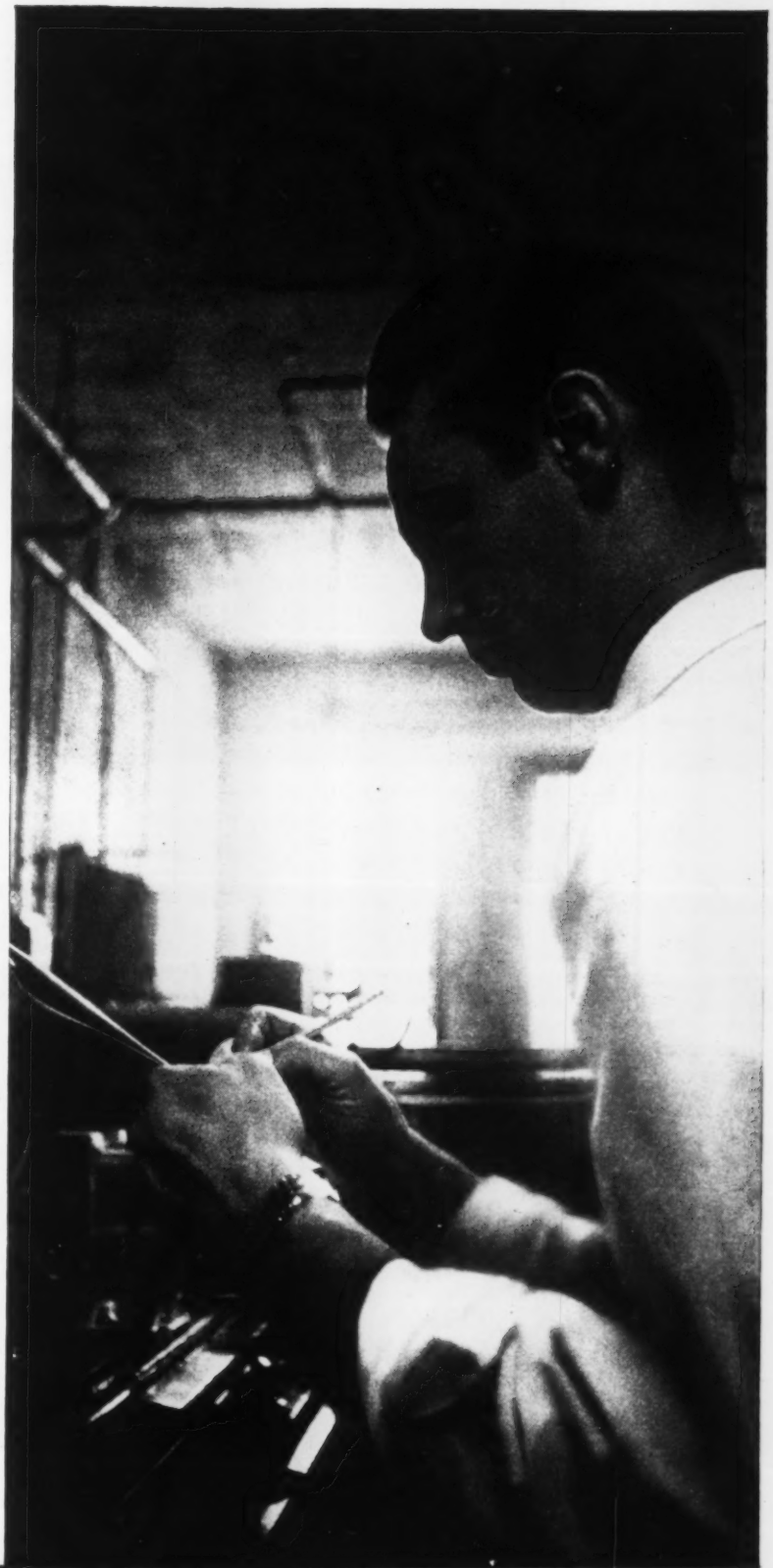

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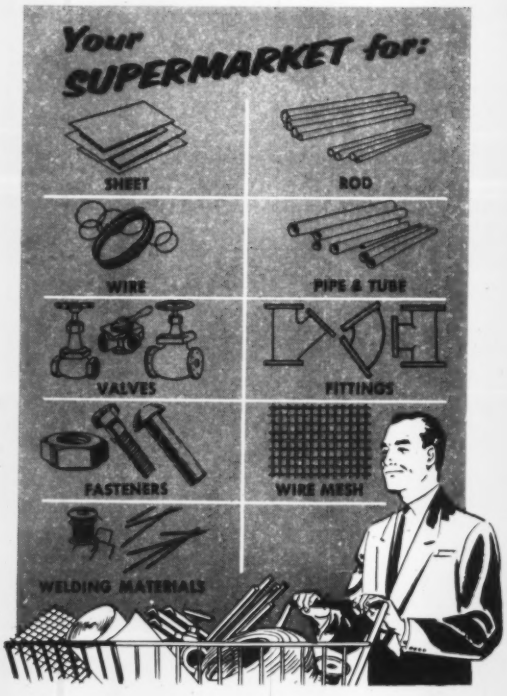


# Dollars Are Keys to Machine Selection

**Showing off an estimated $4 million worth of new machine tools, a GE spokesman discusses some of the problems that go with determining a capital investment**

WHEN a manufacturing man is planning new facilities or selecting new equipment, he must consider the financial justification of each plan or each choice. The job can't be left solely to the financial managers.

That's the opinion of W. W. Kuyper of GE's Large Steam Turbine-Generator Dept., Schenectady, N. Y. Speaking at a press conference last Thursday, Mr. Kuyper told how the justification was applied to buy new production equipment for his department.

Five specially built numerically controlled machines were introduced at the conference. They were part of a group of 19 new machines shown. All were installed in the last year. (See Page 92.)

**• Evaluation of equipment must include a study of the income and the outgo.**

Mr. Kuyper explained that: "Financial justification consists simply of forecasting the effects of a proposal on the cash flow and on the income account of the business." The income forecast should show the effects of savings made, offset by cost. It should also allow for any increased business that results from the investment.

The cash flow forecast shows, as a function of time, the amount at risk and the time that it is at risk.

Next step: To the financial forecast "we must add the assurance that we have chosen the right plan, and that we propose to buy the tools best suited to the job. It is often easy to justify a second best choice, but the adoption of anything but the best choice will eventually weaken the business. Further, the equipment which is procured must be the best for the job, not for some idealized circumstances that don't exist."

To illustrate, Mr. Kuyper checked off some of the justifications for special vertical boring mills. "A stub bar boring machine, with the tool rotating, proved on paper to be more productive, but considerably more costly . . . conventional medium or light duty machines without special attachments would have cost half as much, done half the work, and their lives would have been short in heavy duty operation . . . modification of the ram structure to permit more double tool cutting increased the output of the machine . . . so did the tracer attachment . . . the chip conveyor was costly, but it relieves the operator of a chore and saves machining time."

In machine evaluation, Mr. Kuyper says, all alternatives must be examined, and at the root of the examination must be the financial justification.

**• Both depreciation allowances and tax rates still act as brakes on capital investment.**

Mr. Kuyper says the war against unrealistic depreciation is about "half won." Revisions that permit greater depreciation in the early years have been a help.

A more serious deterrent to investment, laments Mr. Kuyper, is the high level of corporate income tax. Improvements in the tax rate he feels, would act as a greater stimulus to investment than would a change in depreciation rate.

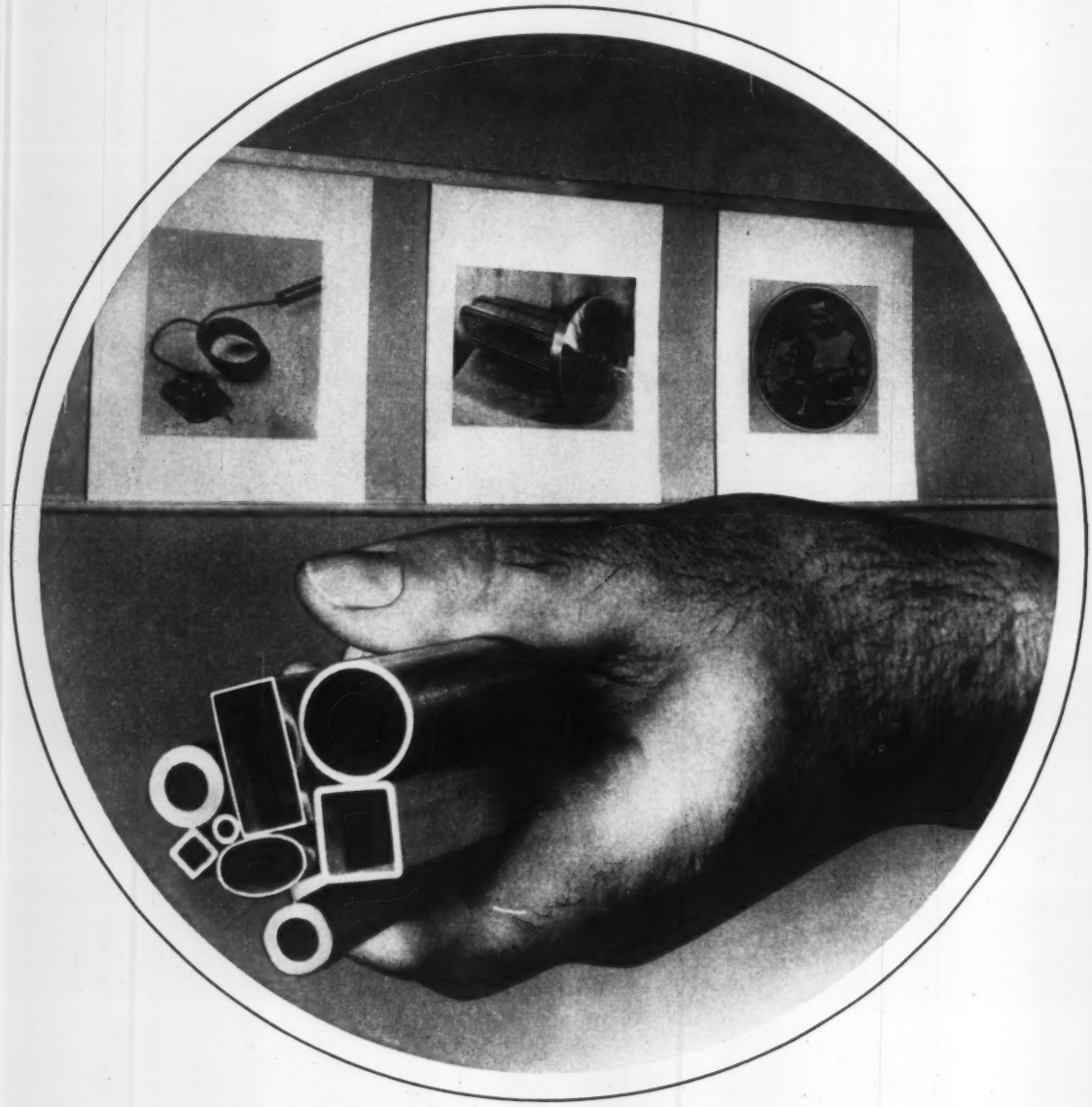
As Mr. Kuyper sees it, depreciation and taxes don't hurt so far as domestic competition is concerned, since all companies are affected. But, he feels the investment deterrents put us at a disadvantage with foreign competition, and "we strain against the taxes which inhibit progress and which hurt us in the competition among nations."

**GE's W. W. Kuyper: It's up to the manufacturing engineers to make financial justification part of their equipment selection plans**

**Says Mr. Kuyper: The limitations on depreciation rates and the high levels of corporate taxes are prime deterrents to equipment procurement**

*Tubexperience in action*

# What are your tubing requirements?



Do you know that tubing can be formed into many unusual shapes? That it can cut the costs of many parts formerly machined from bar stock? That you can get it in many standard analyses or special ones with unique physical and mechanical properties? That no matter what the shape, the physical characteristics, the mechanical properties, the type of application—Superior can supply your needs? Superior is the world's largest producer of small-diameter tubing. More than 120 analyses are offered, including many types of stainless, carbon and alloy steels, nickel and nickel alloys, beryllium copper, titanium, zirconium and super alloys.

Typical of the scope of Superior tubing are those listed on facing page—carbon hydraulic tubing, stainless and carbon mechanical tubing, leaded steel tubing with excellent machining and forming characteristics, pressure and super pressure tubing, tool steel tubing, and many other types to fit most requirements. For assistance in the selection and application of Superior tubing, write for the name of your nearest Steel Service Center stocking this product and a copy of Bulletin 41. Superior Tube Company, 2005 Germantown Ave., Norristown, Pa.

# • SPECIAL SHAPES • COSTS • UNUSUAL PHYSICAL CHARACTERISTICS • UNIQUE MECHANICAL PROPERTIES

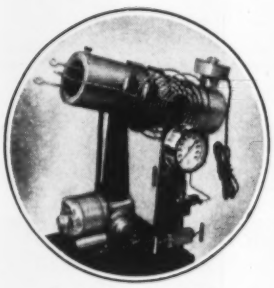
Carbon steel hydraulic tubing

### FOR HYDRAULIC AND PNEUMATIC LINES:

**Superior (SAE) Carbon Steel Hydraulic Tubing.** Made from nonaging steel with high ductility properties in sizes from ⅛ in. through 1⅛ in. 100% hydrostatic pressure and flare tested. OD and ID surfaces are smooth, bright, uniform and protected with a special rust preventive. Recommended for pressures up to 3000 psi.

### FOR HIGH PRESSURE APPLICATIONS:

**Super Pressure Tubing.** Single wall for pressures ranging from 15,000 to 30,000 psi. Available in ODs from .125 to .750 in. Made from Types 304, 316, 321 and 347 and in AISI Type 4130 alloy steel. Composite wall for pressures as high as 100,000 psi. Recommended combinations are low carbon steels and stainless steels, nickel base alloys and stainless steels.

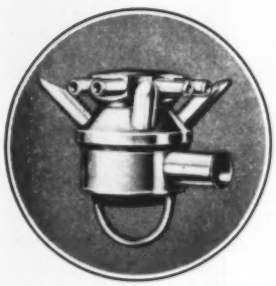


Super pressure tubing

### FOR MANY MECHANICAL APPLICATIONS:

**Seamless Carbon Steel Tubing.** 11 standard and 3 special grades for an endless number of applications. Stocked by Steel Service Centers in a broad range of sizes with diverse mechanical and physical properties.

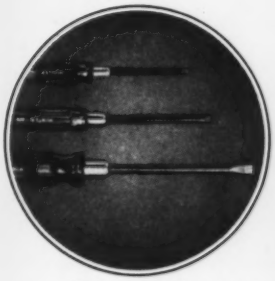
**Seamless & WELDRAWN® Stainless Tubing.** Type 303, for use where a free cutting material is required; offers high resistance to corrosion; assures good end-product surface. Also many other analyses.



Stainless steel tubing

**Leaded Carbon Steel Tubing.** Has built-in lubrication to permit faster speeds, heavier feeds. Will often reduce costs by requiring fewer finishing operations. Available in a range of ODs from .012 through 1⅛ in. in Leaded 1020.

**Alloy Steel Tubing.** In a number of different analyses. Designed for production of such parts as thread guides, races, gear and pinion parts, mandrels, etc.

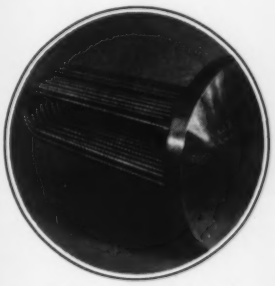


Tool steel tubing

**Tool Steels.** Produced from MT-1095 high-carbon steel and E-52100 alloy steel. Both grades have excellent strength, hardness and wear resistance. Both can be oil hardened to improve toughness and abrasion resistance. Available in sizes from .012 through ⅜ in. OD.

### FOR HIGH TEMPERATURES REQUIRING HIGH STRENGTH, GOOD OXIDATION AND CORROSION RESISTANCE:

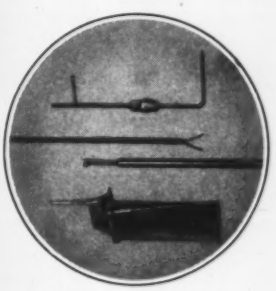
**Super Alloy Tubing:** Analyses include Types 316, A-286, 19-9DL, 16-25-6, Croloy 15-15N, Inconel X, Nichrome V, Hastelloy X, Hastelloy F, Waspalloy, Haynes 25 and N-155. Has a minimum stress rupture strength of 25,000 psi at 1000 hr. and 1200 F. Resists progressive scaling and other types of corrosion. Will not fail through brittle fracture or show excessive grain growth at operating temperature.



Heat exchanger tubing

### FOR HEAT TRANSFER EQUIPMENT:

**Heat Exchanger Tubing.** Made from MT-1010, 502, 304, 304L, 316, 347, 348. Strict adherence to the highest commercial and military combined specincations. Quality controlled with uniform wall and extra close tolerances. Precise surface inspection. 100% flare and pressure tested. Excellent brazing and welding qualities.



Thermocouple tubing

### FOR ELECTRICAL, ELECTRONIC AND SPECIAL APPLICATIONS REQUIRING GOOD CORROSION RESISTANCE:

**Nickel Alloys:** Analyses include Low Carbon Nickel, A Nickel, D Nickel, DURANickel, Monel, Inconel, Ni-Span C, Nionel, Nimonic, Hastelloy, Haynes 25, Permalloy, Chromel P, Alumel, Nichrome V and Invar. Many sizes, shapes and tempers. Excellent corrosion resistance, high strength and workability.

*Superior Tube*

**The big name in small tubing**

**NORRISTOWN, PA.**

*All analyses .010 in. to ⅜ in. OD—certain analyses in light walls up to 2½ in. OD*

West Coast: Pacific Tube Company, Los Angeles, California • FIRST STEEL TUBE MILL IN THE WEST

# Ford Revitalizes Quality With New Audit System

**Audit team of engineers and technicians probes 15 cars daily at each Ford assembly plant. More than 1500 points are rechecked after cars leave assembly lines**

WHEN you buy a Ford, your chances of getting a good one are a lot better than they used to be.

The reason is a new quality audit program that's paying its way, says John A. Fournier, chassis quality manager, Ford Motor Co., Dearborn, Mich., who described its benefits to those attending the annual quality control convention at Cleveland, May 25.

Savings in warranty expenses are footing the bill. Reports from the powerful, vocal dealer councils reflect the improvement, and letters from owners who say they're satisfied are on the increase.

**• The quality staff first decided a change was needed to simplify communications with management.**

Ford used to rely more heavily on in-plant or process inspection. Quality control men spotted at critical points in the assembly line checked samples during car construction (6000 or 7000 cars a day mean sampling 30 million parts).

To improve performance, Ford decided it needed a simpler, more effective way to express quality just as cost is measured in dollars and production in numbers. Complex graphs or half-answers weren't enough. It needed a system which could identify a weakness and tie it directly to the source. The method must permit management to regulate quality the same way it handles production and finance.

**• The program depends on engineer audit teams who check finished cars after release for shipment.**

At each assembly plant (there are 14), audit teams examine cars on the loading docks. Each team selects 15 cars at random each day, thoroughly checks some 1500 items, and reports the results to the plant quality control manager.

Separate forms are used for four inspection areas: Body visual, body sealing, chassis visual, and driving. Visual includes paint, glass, finish, trim, and window operation. Water booths pour on hundreds of gallons of water at high pressures to test door and window openings. Chassis checks are for mechanical structures like frame, transmission, engine, and steering. Driving and acceleration tests pick up performance details like engine, noise, brakes, and clutch operation.

**• Point ratings reduce defects to numbers for easy comparison.**

Minor imperfections are given a rating of 0.2 point; major conditions get up to 2 points. Total defects on one car fall into one of five predetermined categories which are easily described to management in daily reports.

Many automotive quality ratings are matters of opinion, says Mr. Fournier. So even the auditors are audited regularly by Dearborn staff people. If ratings given by the general auditors are the same as those being given locally, management feels reassured the program is operating properly.

As a final step, the quality staff measures the number and value of customers' requests for repairs. (It's called a dealer repair order analysis.) Although customers' opinions aren't questioned, they are weighted on the basis of motivation: A deviation must be pretty important to have made the customer give up his car for a few days. The repair order analysis becomes doubly significant when trouble trends match those of the staff auditors.

**• A good quality program has four major features, Ford concludes.**

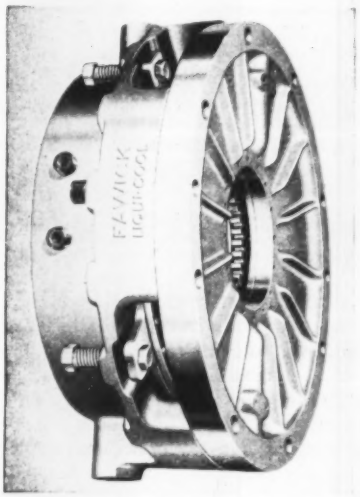
Successful product control involves: 1. Standards which are closely calibrated to what the customer thinks he wants. 2. Continuous measurement of performance against those standards. 3. Fast identification of a problem. 4. Assignment of responsibility for correction.

# Clutch, Brake Unit Runs Longer, Cooler

**Low comparative wear rate results from better heat removal from friction surfaces (up to ten times faster than conventional units). Cooloff time is eliminated**

IF YOU need an industrial type clutch or brake unit for high inertia starting or stopping, consider the new liquid cooled units made by Fawick Airflex Div., Fawick Corp., Cleveland.

High heat dissipation (up to ten times greater than conventional units, says Fawick) makes it suitable for severe high friction use.



**Copper pressure plates and liquid cooling end friction heat problems**

The low wear units (disc type) provide precise tension control and excellent horsepower absorption for continuous slip clutching and braking. Possible applications: Ball mills, centrifuges, winding, and coiling.

• **Heat Transfer** — Copper alloy pressure plates with spiral grooved backs (in direct contact with the coolant) assure good heat transfer. Copper's thermal conductivity is about eight times greater than the cast iron previously used. This eliminates heat buildup, warping or cracking of plates, cooloff periods, and excessive heat transfer to nearby components.

• **Other Features** — Fawick clutch and brake units can be actuated by hydraulic fluid, water, or even air. Main and auxiliary pistons operate over a larger pressure range than conventional units (0 to 75 psi). It is designed for low cooling water usage.

Five basic sizes of single and dual disc designs are being produced. Torque ratings for single disc units range from 4500 to 100,000 in.-lb. Dual disc units provide twice the capacity with the same diameter and mounting dimensions. Disc sizes range from 7¾ to 24 in. The internal gear drive features a straight-through bore for use on shafts from ¾ to 10 in. in diameter.

Fawick is manufacturing and marketing the unit under exclusive license (for industrial use) from Raybestos-Manhattan Inc., Passaic, N. J.

# New Method Contours Stainless Steel Honeycomb

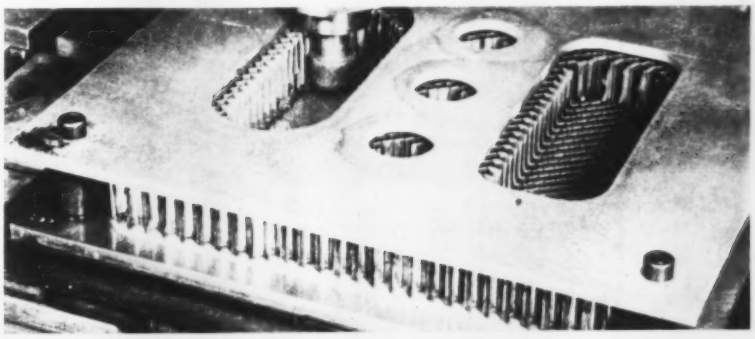
**Using a modified electrolytic machining approach, it will generate nearly every shape that can be produced on solid materials. Close tolerances can be held**

THE PERNICKETY job of cutting compound contours on honeycomb still is under attack.

The latest entry in the race for an economical solution is that of Ekstrom, Carlson & Co., Rockford, Ill. The process, a cautious modification of conventional electrolytic machining, can generate almost any shape, profile, or contour that can be machined on solid metal—and it does it with the soft touch required for fragile stainless honeycomb foil walls.

Long, narrow, oval, or round recesses apparently pose no production problems with the Eckstrom, Carlson method, and close tolerances can be held with little difficulty. Surfaces are burrfree, and there are no heat cracks.

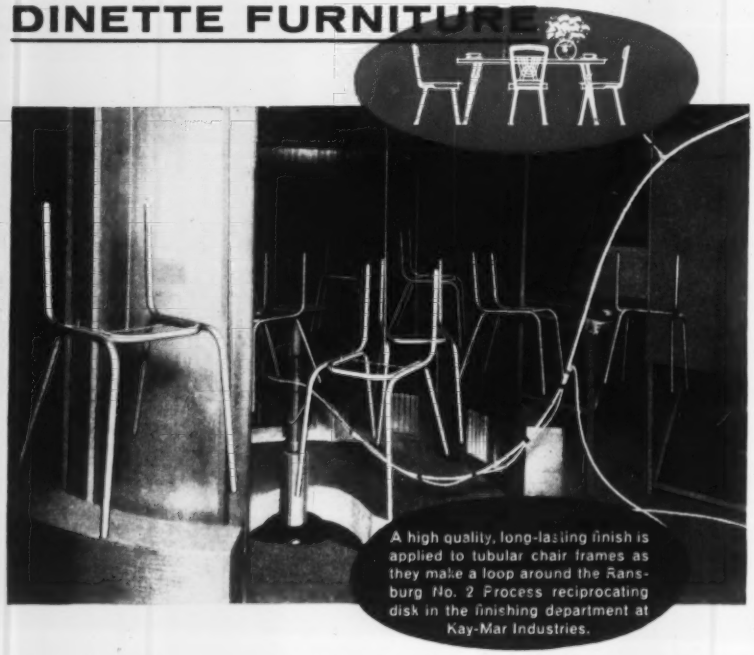
Using a modified tracer, the machine can duplicate involute curves, diagonals and spiral cuts.



**An overlay template governs the path of this end-mill type wheel as it routs and bores shaped cavities in honeycomb**

RANSBURG *Electro-Spray...*

**PROVIDES 50% PAINT SAVING (over the former dip method) in the finishing of KAY-MAR DINETTE FURNITURE**



A high quality, long-lasting finish is applied to tubular chair frames as they make a loop around the Ransburg No. 2 Process reciprocating disk in the finishing department at Kay-Mar Industries.

● Kay-Mar Industries, Cassopolis, Michigan, switched from the dip method to Ransburg Electrostatic Spray Painting because they wanted to improve the quality of the finish on their metal furniture line.

Now, with electrostatic spray painting, they get a heavier, more uniform application, which was not possible with former dip. With electrostatic, they are able to use metallic coatings with higher metal content. In their magazine advertising to the mobile home industry, they proudly say: "Finest finish in the industry at no additional cost to you!"

Electrostatic provides other advantages at Kay-Mar. They picked up some additional—and much needed—floor space when dip tanks were removed. Their insurance rates were reduced because of improved "housekeeping" conditions. Frequent color changes are made quickly and simply, and rejects—which used to run 1½%—are reduced to less than a quarter of one per cent.

**NO REASON WHY YOU CAN'T DO IT, TOO!**

Let us test prove the advantages of automatic electrostatic spray painting on your products in our complete laboratories. No obligation. Call or write for our No. 2 Process brochure, which shows a variety of automatic painting installations on a wide variety of products. Or, if your production doesn't justify automatic painting, let us tell you about the new Ransburg No. 2 Process electrostatic hand gun, now widely used by both large and small manufacturers.

RANSBURG

**RANSBURG**
**Electro-Coating Corp.**
Box-23122, Indianapolis 23, Indiana

## Carbon Steels Combined, Cut Wear in Sliding Parts

Two carbon steels, a maximum hardness type and one having high hardness and stiffness properties, are being used together successfully for a sliding application in a textile machine component, a needle positioner for industrial sewing machines.

A needle bar, made from light tubing, moves up and down inside a tubular bearing. Originally, the tubular bearing (½ in. OD x 0.120 in. wall thickness) was made from C-1025 carbon steel. Excessive wear showed that a harder material was needed.

The inventor and maker, Edward Blankenship, Linden, Tenn., called on Superior Tube Co., Norristown, Pa., for help.

• **MT-109 and E-1095**—Acting on Superior's suggestion, Type MT-1095 carbon steel tubing was selected because it can be easily carburized to provide maximum hardness on the wearing surface. Strength is of no particular concern because the bearing is short and well supported.

The needle bar is longer. It requires hardness with enough stiffness to resist bending. Here, Type E-1095 tubing was selected because it can be heat treated to provide the required hardness. The OD is 0.285 in. and the wall thickness is 0.032 in.

Some of the components made with these steels have been in use for more than a year without showing signs of wear.

• **Another Problem Solved** — The needle positioner is adaptable to a wide variety of industrial sewing machines. It raises the needle automatically when sewing is stopped, and permits the work to be cleared without lost time or motion.

A steel plug (¾ in. long) is welded to one end of the needle bar and is then drilled to provide holes for the needle and screws.

Initially, steel plugs from annealed bar stock developed hard spots after they were welded to the tube. They were almost impossible to machine. This was eliminated by a postwelding anneal at 1250 to 1300° F and slow cooling.

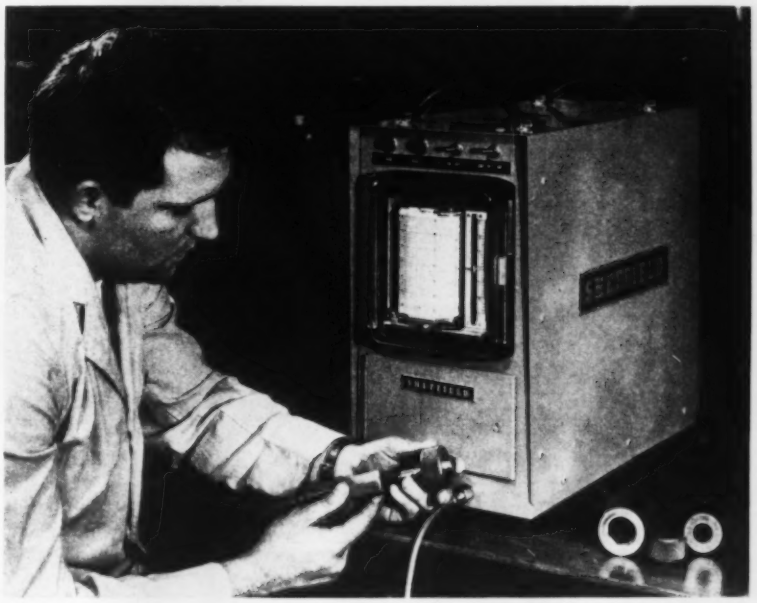
# Instrument Air Gages and Records Simultaneously

DATA gathering for dimensional quality control charts or a charted record to serve as a size certificate can be made to machine accuracy with the Sheffield gaging and recording instrument.

The Air Gage Recorder, which uses hand or fixture-type air gage tooling, makes an automatic record showing a part's plus or minus deviation from nominal size on a 4 in. wide strip chart during gaging.

The standard model has a continuous chart drive and will inspect a single dimension. The instrument can be built to check two dimensions and can be equipped with optional features such as maximum and minimum signal lights, and an index drive to move the chart about $\frac{1}{8}$ in. on each gaging operation.

Back-pressure type air gage tooling is used as the size-sensing elements, including Open-Jet, Balljet, and Bladejet spindles, Air Snaps and Air Rings, and Plunjet gaging cartridges. Flow-type tooling up to 2000 to 1 amplification generally can be modified for use with the Sheffield Air Gage Recorder.



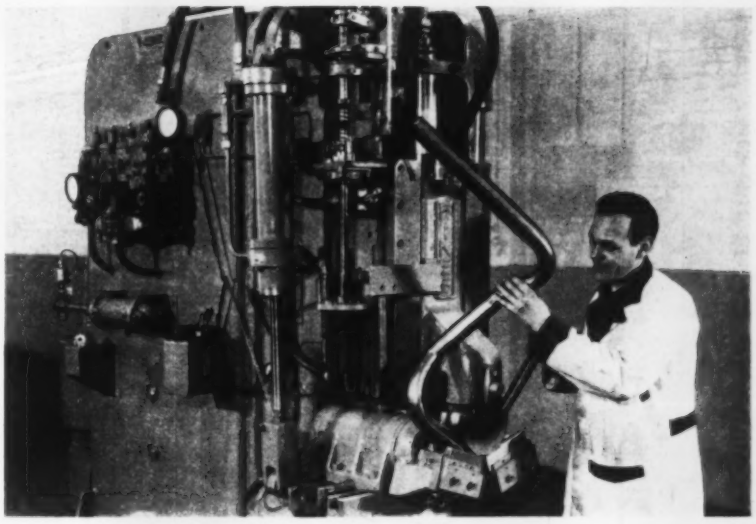
For more information, *write* Sheffield Corp., Dayton 1, Ohio.

# Press Bends Odd-Shaped Workpieces Easily

OFFSET ram die construction of the Pines 20 ton bending press provides more working clearance around, above, and below the dies when bending odd-shaped workpieces. Automotive exhaust, tailpipe, and crossover tubes that require a number of bends in different planes are examples.

The offset ram die boosts output capacity and reduces tool cost since more work can be produced in a single setup.

A new ram cylinder deceleration circuit on the press assures more positive control of the ram at the end of the bending stroke, and improves accuracy. The heavy, ribbed, cast steel, C-type frame contributes to accuracy and provides the neces-



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Call Richard L. DeChant, Manager, Area Development Department, The Cleveland Electric Illuminating Company, Room 410, The Illuminating Bldg., Cleveland 14, Ohio.

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sary stability for handling large work on a long-run basis.

Variable speed control assures efficient, high speed operation to suit a wide range of work. A single screw adjustment sets both wing dies simultaneously which saves time and eliminates problems of equalizing die settings. A constant equalizing pressure is maintained throughout the bend cycle to prevent excessive distortion or wrinkling of the workpieces. Maximum capacity of the press is steel tubing with a 2 in. OD and 0.083 in. wall. For more information, *write* Pines Engineering Co. Inc., 601 Walnut St., Aurora, Ill.

## Belt Grinders Permit Low Cost Job Setups

A LINE of 2½ in. belt grinders fills the need for low-cost machines to do fast, efficient grinding, buffing, and deburring in metalworking shops, maintenance shops, toolrooms, and other industrial areas.

In addition to the four standard setups (single horizontal, double horizontal, horizontal and vertical, and double vertical), low-cost special job setups are possible with accessories. They include a vertical support unit, safety guards, dust and chip chute, fully adjustable platen, dust collector, and an adjustable tool rest for grinding.

A 4-in. backstand idler unit is also available. With this unit a polishing lathe using setup wheels or a bench grinder using grinding

# WHY DID THIS BOLT FALL OFF?

*Where* is the culprit . . . the nut whose function was to keep the bolt securely in place? Undoubtedly it fell off earlier . . . loosened by vibration . . . or unexpectedly high shock loads due, perhaps, to a careless operator. In any event, the bolt was pounded into uselessness . . . and failed. Chances are that the equipment the bolt and nut were part of is temporarily useless too.

*Why* then, was an inadequate fastener applied in the first place? Perhaps because "bolts and nuts" are often overlooked or specified routinely. Perhaps to save a fraction of a cent. Whatever the reason, the end result was inefficient and uneconomical. The nut failed—the fastening failed—and the product failed.

It could have been prevented. An Elastic Stop® nut would have held on. The small extra cost of the *best* self-locking nut would have solved this case . . . saved repair bills . . . downtime . . . and a manufacturer's reputation.

For detailed photos showing how some of America's foremost manufacturers of heavy equipment have insured critical bolted connections with Elastic Stop nuts on such units as rock drills, scrapers, snow plows, off-the-road trucks . . . write to ESNA. Or, for first hand proof, tell us the preferred size and we'll send you test samples. Address: Dept. S35-660, Elastic Stop Nut Corporation of America, 2330 Vauxhall Road, Union, New Jersey.

**DOUBLE DEPENDABILITY**

**The dependability built into every Elastic Stop nut builds itself into the dependability of every product on which it is used.**

## ELASTIC STOP NUT CORPORATION OF AMERICA

This 24" floor model drill tailored for toolroom work includes Infispeed drive and 42" x 24" table.

Buy your new medium duty 16" or 24" CINCINNATI Sliding Head Drill *just as you want it*—with selected specialized equipment factory-installed and tested! Buy only the cost-saving combination you need to suit your toolroom, production or job shop requirements EXACTLY!

NEW BACK-GEAR SPINDLE DRIVE

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NEW BUILT-IN ELECTRICAL TAPPING ATTACHMENT

INFISPEED VARIABLE SPEED DRIVE

OTHER COMBINATIONS

Geared and Air Power Feeds, Manual and Automatic Work Holding Fixtures, Plain or T-Slotted Work Tables, Variety of Spindle Types and Sizes, Motor Driven Coolant Pump.

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*"TRAY-TOP" Lathes • "CINCINNATI" Drilling Machines*
*"SPIROPOINT" Drill Sharpener*



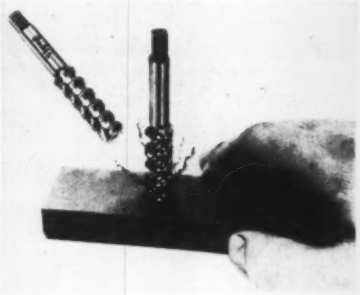

wheels can be converted for coated abrasive belt grinding and polishing.

For more information, *write* Dept. 1007, Walker-Turner Div., Rockwell Mfg. Co., 400 Lexington Ave., Pittsburgh 8, Pa.

## Tap for Difficult Metals

YOU CAN GAIN tool life, greater accuracy, and accelerated chip removal with the Hy-Spiral Tap. Stringy and high temperature alloys such as stainless steels, boron steels, Monel, Hastelloy B, Inconel X, and ductile steels such as annealed SAE-1018, can be tapped to close tolerance.

The tap features a 52 degree spiral. This provides high shear at the cutting point and uninterrupted chip ejection. This feature coupled



with the 10 to 12 degree face hook and a 2 to 2½ thread chamfer provides smooth, accurate threads in even the most difficult to machine metals.

The free cutting action and positive control of chip flow makes the Hy-Spiral Tap especially suited to both aluminum and zinc diecastings which are difficult to tap blind in the vertical position.

For more information, *write* DoAll Co., Des Plaines, Ill.

## Cleans Coolants of Chips

FERROUS solids are automatically removed from cutting oils and other soluble coolants with the compact Magnaflo Separator.

Self-cleaning, it eliminates the need for sump cleaning, changing of filter paper, bags or cartridges, and delivers nearly dry sludge for

## ESCO CENTRIFUGAL CASTINGS KEEP

# MACH 17 IN A TUBE!

Tremendous pressures and temperatures are generated in this shock tube at Lockheed Aircraft Corp., to simulate conditions encountered by a long-range ballistic missile re-entering the earth's atmosphere. High pressure gas triggers shock waves which travel 17 times the speed of sound. Instantaneous temperatures range above 15,000 degrees F.

The 44-foot long tube is an assembly of *ESCO* heavy-wall Spuncast® castings hydrostatically tested at 10,000 PSI. It is typical of the many exacting casting jobs that wind up at *ESCO*.

Simplify your design problems by calling *ESCO* for special alloy steel Spuncast pipe, standard heavy wall fittings, and special design fittings and valves.

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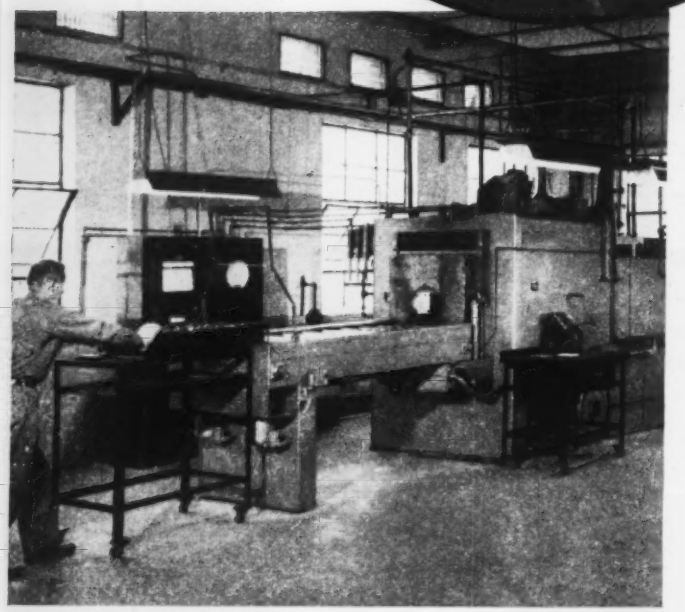


# Hevi-Duty furnace earns $1,000 per month for Bedford Gear

The installation of a Hevi-Duty Clean-Line, automatic, heat treat unit has *eliminated $1,000 per month in scrap losses* for Bedford Gear and Machine Products Company, Bedford, Ohio.

In addition to the elimination of rejects, savings in time, handling and outside heat treating costs have been realized.

The Clean-Line installation includes a Carbonitrider, Washer, Atmosphere Draw Furnace and a 1000 CFH Endothermic Generator. All loading tables are the same height, enabling Bedford to transfer loaded baskets from one unit to another on a dolly, with no lifting or straining. Once loaded, the individual parts are not handled again until they come out of the draw, completely heat treated.

Carburizing is usually done at 1700° F. with case depths of .030 in. obtained in three hours at heat. Carbonitriding is run at 1550° F. to 1625° F., depending upon case depths desired, core hardness and bore size to be held. Automatic control of the quench oil temperature between 150° F. and 250° F. also helps control size which, in many instances, is held to within .001 in.

Bedford's savings over previous operations and elimination of rejects will pay for the new equipment in a matter of months. Modern equipment can improve your costs and quality. Let us send you a detailed bulletin on Hevi-Duty Clean-Line equipment — and arrange for an engineer to call and show you ways to reduce costs, improve quality. Write for Bulletin D-100.

- Industrial Furnaces electric and fuel
- Laboratory Furnaces
- Dry Type Transformers
- Constant Current Regulators

HEVI-DUTY ELECTRIC CO.
Milwaukee 1, Wisconsin

## NEW PRODUCTS and equipment

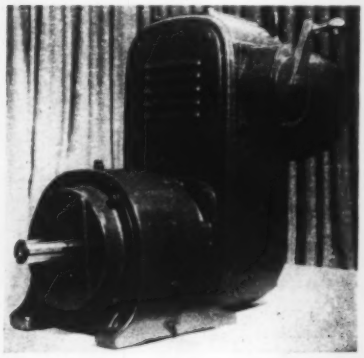
easy disposal. The unit operates without attention and it is virtually free of maintenance expense for the life of the equipment.

For more information, *write* Dept. LR, U. S. Hoffman Machinery Corp., Thompson Road Plant #1, Syracuse, N. Y.

## Belts Changed Easily on Adjustable Speed Drives

EASE and simplicity of belt changing, smooth operation of the stepless control mechanism, and compact industrial appearance are featured in the Polydyne mechanical, adjustable speed drives.

The units operate on the principle of V-belt connected, adjustable pitch pulleys. The actuating force is directed through an equalizer which prevents any binding or sticking of the speed control function.



The drives are offered in ¼ to 25 hp in output speeds from 5 to more than 4000 rpm, with standard speed variations of 2, 3, 4, and 5 to 1.

For more information, *write* General Electric Co., Schenectady 5, N. Y.

## Universal Drillhead Has Cartridge Type Spindle

FAST, easy removal of spindles, bearings, and related parts are advantages of the cartridge type spindle plate construction available with Thriftmaster universal joint type adjustable drillheads.

The cartridge plate provides spin-

# *Continental* has the cure for vibration "headaches"

## the one-piece locking screw that

# won't work loose

**IN MARKET CARTS** — STAY TIGHT, RESIST SHOCKS OF SEVERE SERVICE

HOLTITE NYLOK hex head cap machine screw fastens chrome-plated steel tubing at right angles. Driven through holes in one section into tapped steel plug in end of adjoining part. Hold securely despite punishment of customer use.

**IN CARBURETORS** — HOLD ADJUSTMENT OF ANTI-STALL CONTROL

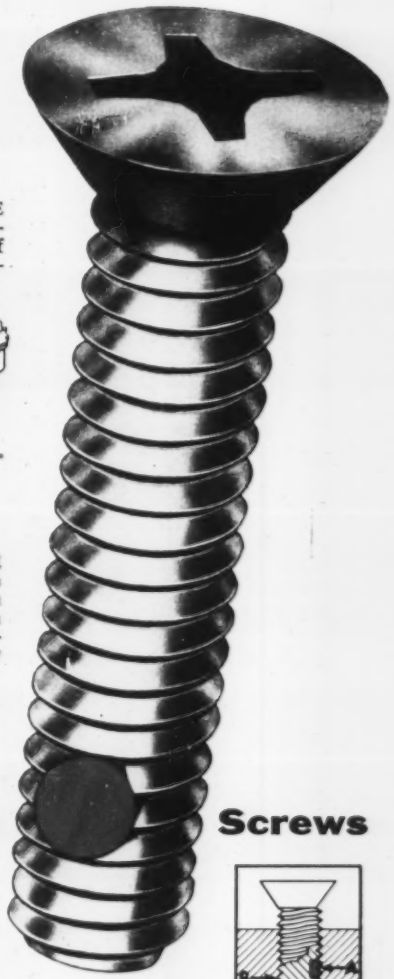
Hex head steel HOLTITE NYLOK machine screw maintains constant adjustment of anti-stall device attached to carburetors. Holds spring at required tension without variation through wide range of temperature changes.

**IN EXHAUST FANS** — HOLD MOTOR SECURELY DESPITE VIBRATION

Phillips truss head steel HOLTITE NYLOK machine screws are driven through rubber insulation mount into flange of vertical mounted motor. Screws do not loosen, resist constant vibration.

**IN SHEARS AND SCISSORS** — HOLD BLADES IN PROPER ADJUSTMENT

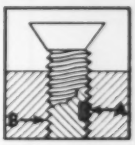
Binding head steel HOLTITE NYLOK machine screws are driven through drilled hole in one blade into tapped hole in mate. Hold proper blade contact, — permit easy disassembly for sharpening.



## HOLTITE® NYLOK® Self-locking Screws

**HOLTITE® NYLOK** machine screws are the simplified self-locking fasteners with the Nylon insert that eliminates the need for lock washers, jam nuts, wiring and similar devices. If you have assemblies where screws *must stay* where they are set, NYLOK is your practical choice. The applications above show how you can save trouble and complaints, — give your product a sales advantage.

**CHECK YOUR ASSEMBLIES** — find out where Continental engineered fasteners, like HOLTITE NYLOK, can cut your assembly costs. Plan now to consult the Continental Assembly Specialists. They will analyze your operations and tell you which fasteners — *standard or special* — can save you most. For prompt service, write or phone: Continental Screw Co., 462 Mt. Pleasant St., New Bedford, Massachusetts.




Resilient nylon plug (A) sets up a lateral thrust, smoothly wedges mating threads together (B). All locking action is on threads: head is not stressed. Locking is positive . . . seated or unseated.

**One piece — no separate parts**
**Can be removed and replaced**
**Interchangeable — reusable**
**Locks seated or unseated**
**Acts as seal for gases, liquids**

# CONTINENTAL

SCREW COMPANY, NEW BEDFORD, MASS.

## HOLTITE FASTENERS

**HY-PRO TOOL COMPANY** . . . DIVISION
**RESEARCH ENG. & MFG., INC.** SUBSIDIARY

**HOLTITE PHILLIPS AND SLOTTED HEAD**
WOOD • MACHINE • TAPPING
THREAD FORMING •
SEMS • NYLOK
**HY-PRO PHILLIPS INSERT BITS AND HOLDERS**

# PAYLOADER®

## Handles the tough jobs

## indoors and outdoors

Most foundries find that smaller "PAYLOADER" tractor-shovels best meet their needs. But in this one a big 4-wheel-drive model is just right. "I couldn't have bought equipment better fitted to the job if I had paid twice as much," says Don LaTulip, the owner.

Four times a day it works indoors scooping up the hot sand, gagger rods and scrap from the pouring floor and dumping it on grizzly bars. Outdoors it picks up and loads out the cupola drops and waste, including 1½ ton slag skulls, also levels the waste dump and does crane and carrying work.

There is a proven size and type in the complete "PAYLOADER" tractor-shovel line that will just fit the tough handling jobs in *your* plant or yard. Carry capacities from 2,000 to 12,000 lbs., plus crane hook, lift forks, pick-up sweeper and snow plow attachments. A Hough Distributor is ready to serve you.

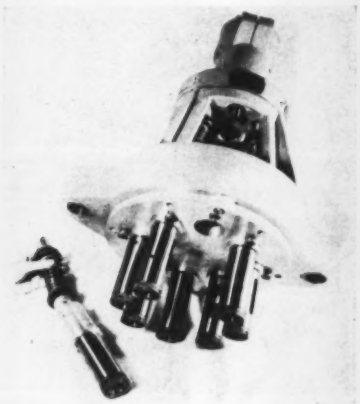
**HOUGH®**

THE FRANK G. HOUGH CO.
LIBERTYVILLE, ILLINOIS
SUBSIDIARY — INTERNATIONAL HARVESTER COMPANY

Send data on the Complete PAYLOADER line and attachments

Name
Title
Company
Street
City State
S 5-B-6


## NEW PRODUCTS and equipment



dle rigidity and accuracy usually found in fixed center heads while retaining the adjustable feature for application to various hole patterns. The cartridge containing spindle can be removed from the plate as a complete unit by taking out a single lock screw.

Cartridge type spindle plate construction can be furnished with any of the Thriftmaster standard, semi-standard, or special universal joint adjustable drillheads.

For more information, *write* Thriftmaster Products Corp., 1044A N. Plum St., Lancaster, Pa.

## Swing Type Metal Saw Cuts Heavy Sections

USEFUL for both production and maintenance work, this all-purpose swing saw produces clean, high speed cuts on heavy structural members, bars, test sections, forging

Aeroquip Hose Lines on the hydraulic system of this brake plate spot welder withstand vibration and constant flexing.

# "We Use Aeroquip Hose Lines for Replacements Wherever Possible"

**Reports Maintenance Foreman, Jackson Plant, Kelsey Hayes Wheel Company, Inc.**

Aeroquip Hose Lines have proved to be long-lived and dependable in many busy plants. At Kelsey Hayes' Jackson Plant where Aeroquip Hose and Reusable Fittings are widely used for replacement lines, the maintenance foreman reports long, trouble-free service. Some Aeroquip Hose Lines have seen more than two years' service on hydraulic systems on which rigid tubing had failed in a matter of months.

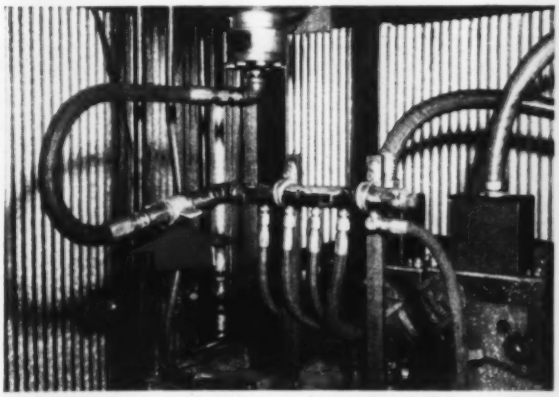
Make Aeroquip Hose and Fittings your standby for quick replacement hose lines that give enduring service. Call the Aeroquip Distributor listed in your Yellow Page Phone Book for full details.

Aeroquip

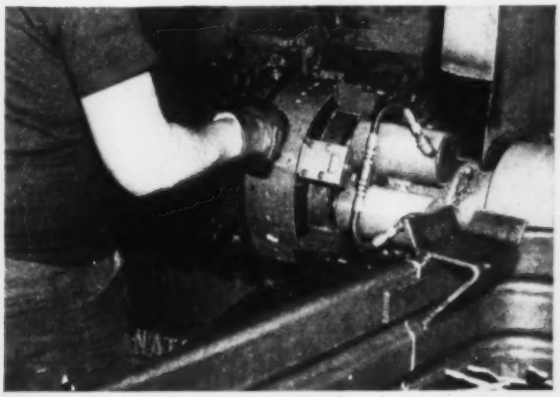
**AEROQUIP CORPORATION, JACKSON, MICHIGAN**

INDUSTRIAL DIVISION, VAN WERT, OHIO • WESTERN DIVISION, BURBANK, CALIFORNIA
AEROQUIP (CANADA) LTD., TORONTO 19, ONTARIO

AEROQUIP PRODUCTS ARE FULLY PROTECTED BY PATENTS IN CANADA, U.S.A. & ABROAD



Closeup of Aeroquip Hose Lines and Aeroquip Self-Sealing Coupling (arrow) on the spot welder. The coupling separates to permit quick setup of the welder without bleeding hydraulic system.



The Aeroquip Lines on this spot welder have been in service more than two years despite constant vibration. This unit welds more than 500 brake shoes per hour.

blanks, extrusion blanks, high temperature alloys, die blanks, heavy cable, pipe, and many other materials.

The machine provides straight feed or oscillating feed at the option of the operator. When the operating button is pressed, the blade moves forward and backward, in and out of the cut, in line with the cutting plane. That reduces the arc of contact with the blade, increases blade life, increases the speed of cutting, and makes for generally burr-free abrasive sawing either wet or dry.

Other features include a powerful main motor (30 hp), sealed bearing spindle, timing belt drive, and a new dynamic suspension system that permits light fingertip feed without springs, counterweights, or adjustments.

For more information, *write* Ty-Sa-Man Machine Co., 1103 White Ave., Knoxville 1, Tenn.


**New King-Sized DUMPMASTER Automatically Collects and Hauls Up To 120 cu. yds. of Refuse per Trip**

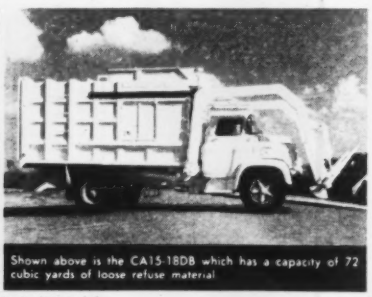
**DEMPSTER BROTHERS' Newest Addition Cuts Waste Disposal Costs**

The famous DEMPSTER-DUMPMASTER 24DB now has a big brother in the CA60-30DB model. Like the original Dumpmaster, it automatically handles detachable containers in one through six cubic yard sizes. However, it can pick up a gross load of 6000 pounds as compared to the 24DB's 3000 pound capacity.

Another important difference in capacity—the new model can compact up to 120 cubic yards of loose refuse while the 24DB gets up to 100 cubic yards per trip. Like all Dumpmasters, the new 30DB has clearance arms for safety . . . they never pass the cab windows . . . can't injure the operator.

**Write For FREE BROCHURE**

Shown above is the Dempster-Dumpmaster CA30-24DB model which has a capacity of 100 cubic yards of loose refuse material



Shown above is the CA15-18DB which has a capacity of 72 cubic yards of loose refuse material

Patents Pending

DEMPSTER BROTHERS Inc.

The Originator and Only Manufacturer of the

DEMPSTER DUMPSTER® SYSTEMS

Dept. S-6

DEMPSTER BROTHERS • KNOXVILLE 17, TENN.


## Resistance Welding Alloy

AN ALLOY of copper and zirconium, Mallory 28 Metal, is recommended for applications where improved resistance to annealing or softening is required, and resistance welding applications where other alloys are prone to checking and cracking.

It is also recommended for spot and seam welding of aluminum and magnesium alloys, and steels having low melting point coatings, such as galvanized, aluminized, terne plate, tin plate, and cadmium plate.

The alloy has exceptionally high electrical and thermal conductivity coupled with high strength and hardness. The properties of the material are developed through a combination of cold working and heat treatment.

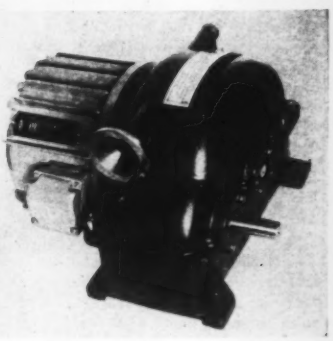
For more information, *write* Metallurgical Div., P. R. Mallory & Co. Inc., Indianapolis 6, Ind.

## Variable Speed Drive Has Constant Horsepower

HERE is a variable speed drive, designed around a newly developed combination TV-Belt that provides a 3:1 ratio with basically constant horsepower. The driver of the TV-Belt is a timing belt pulley which gives constant feet-per-minute travel to the belt.

Speed is adjusted by a segment of a worm gear that is mounted to one of the idler-carrying side plates. It is actuated by a worm which is turned by the handwheel on the unit or which can be motorized.

While the transmission has a rated capacity of 1.5 horsepower with input speed of 1750 rpm and



# THE BEAUTY OF utility

The Stainless Steel products illustrated are made by STEELEX Corporation, Williamsport, Pa.

## in Superior Stainless

### STRIP STEEL

SERVICE-ABLE Superior Stainless performs handsomely in these functional utensils—always bright, easy to clean, with extra strength for extra years of use. • Superior Stainless delivers handsome performance in fabrication, too . . . handles *right* because of superior quality control at every stage of manufacture. • We have much to offer in technical assistance. Write us on your stainless applications.

**SUPERIOR STEEL DIVISION**

OF

COPPERWELD STEEL COMPANY

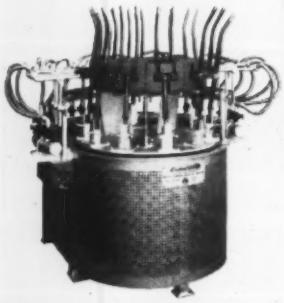
CARNEGIE, PENNSYLVANIA

For Export: Copperweld Steel International Company, New York

## Columbia produces 250 bicycle forks per hour with automatic GAS brazing

Gas brazing is not new to Westfield, where Columbia bicycle frames have been brazed with Gas-fired Selas processing equipment for many years. During this time, pre-placing of brass filler material and automatic heating have limited dependence on operator skill, reduced material waste, and eliminated costly cleanup operations. With the installation of the new Gas brazing machine in their production operation, these advantages have been extended to include fork manufacture, also.

For information on how Gas equipment can help you in your production operations, call your Gas Company's industrial specialist. He'll be glad to discuss the economies and outstanding results you'll get with Gas and modern Gas equipment. *American Gas Association.*



Two fork styles in all standard bicycle sizes are joined from eight steel components on this new automatic Selas machine by Westfield Manufacturing Co., Westfield, Mass. Controlled combustion and flame geometry bring the parts to brazing temperature of 1750°F in only 86 seconds, using economical Gas equipment.

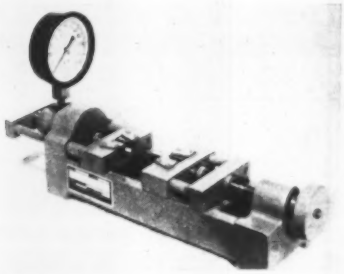
a 3:1 over-all ratio, increased over-all ratios of 9:1 can be obtained by adding an auxiliary gearbox of 1:1 and 3:1 ratios. The inputshaft of the variable speed transmission can be operated through V-belts, timing belts and pulleys, chain and sprockets, or direct electric or hydraulic motor drive.

For more information, *write* Western Mfg. Co., 3400 Scotten Ave., Detroit 10, Mich.

## Portable Tensile Testers Can Make Tests Anywhere

TENSILE tests on round or flat specimens can be made anywhere with a new family of portable tensile testers. They can be carried easily; the net weight of each is only 36 lb.

The testers do not depend on outside power of any kind, since the load is applied manually by rotating a knurled knob. The applied load is then measured by a trapped-oil system.



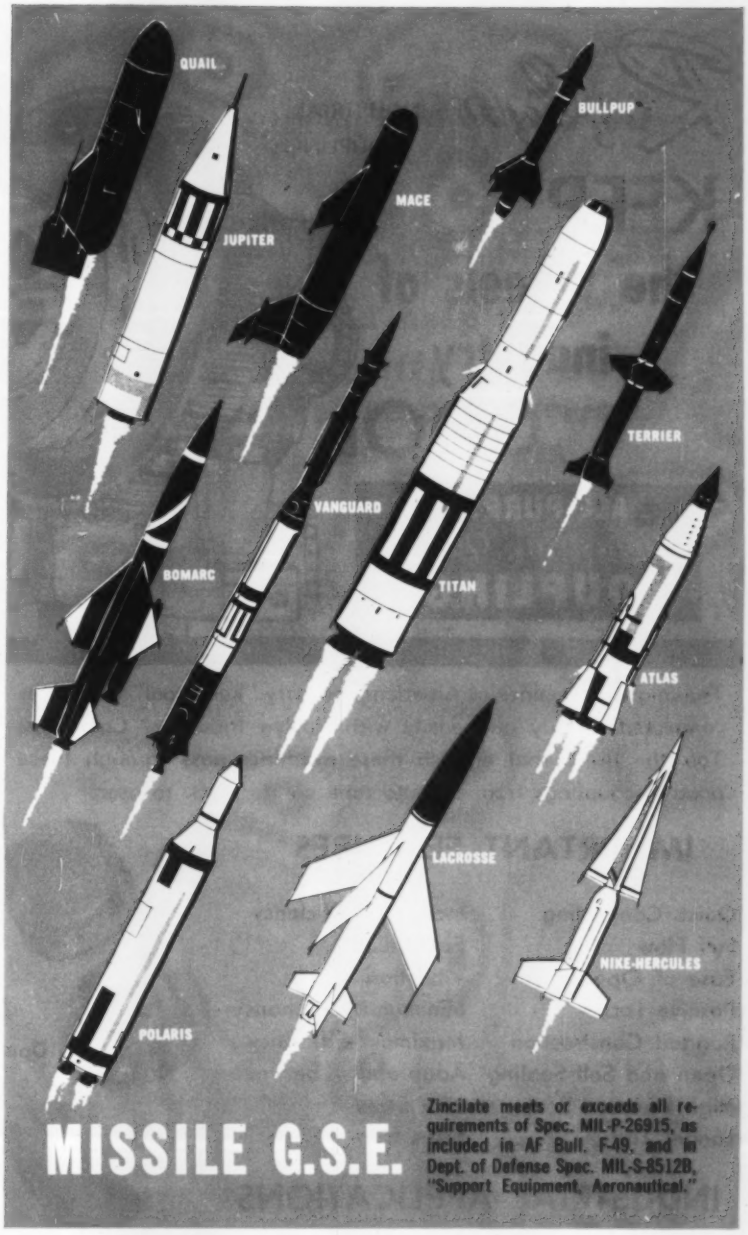
They are available in capacities from 100 to 1000 lb with the applied load indicated on a 4½ in. diameter gage.

For more information, *write* Steel City Testing Machines Inc., 8817 Lyndon Ave., Detroit 38, Mich.

## Machine Polishes and Grinds Flat Stock

THE ACME Model KP machine is made with belt widths of 8, 10, 12, and 15 in.

All of the machines in the line feature pneumatic belt tension, belt tracking, and micrometer grind pressure adjustment. The V-belt drive for the abrasive belt permits belt speed adjustments. The con-




On much of the Missile Ground Support Equipment being produced today, the 1-coat Zincilate finishing system has replaced more costly multi-coat systems. This means simply that a single coat of Zincilate provides as much or more protection than three or even four coats of the materials formerly used. Further, the Zincilate 1-coat system eliminates five of the six cleaning operations required under the old methods. You can give your product —military or commercial— the best protection possible, and still cut your finishing costs, by using Zincilate. Write today for complete information.

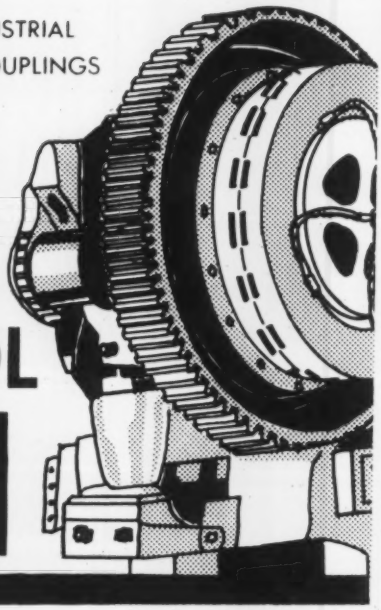
*PROTECTION that SELLS your PRODUCTS*

INDUSTRIAL METAL PROTECTIVES

410 Homestead Ave. • Dayton 8, Ohio • BAldwin 2-6747, 2-6748

Roylyn INDUSTRIAL COUPLINGS

# KEEP the wheels of industry COOL



**ALL PURPOSE** *Industrial "Quick"* **COUPLINGS**

The mighty machines of American industry "keep cool" with lines connected quickly and easily with Roylyn Industrial Couplings. Too, the fluids that nourish these machines pass through these popular couplings from tank to tank car to truck to user.

## IMPORTANT FEATURES

- Quick Connecting
- Full Flow
- Ease of Operation
- Positive Lock
- Rugged Construction
- Open and Self-Sealing
- High Pressure Seal
- Longer Life
- Increased Efficiency
- Economical
- Vibration Proof
- Minimum Maintenance
- Maximum Efficiency
- Adaptability between Like Sizes
- Sizes from 1/4" to 3"

Open

Self-Sealing

## INDUSTRIAL APPLICATIONS

- Hydraulic Test Stands
- Pulp and Paper Mills
- Soap Industry
- Sugar Refineries
- Public Utilities
- Rolling Mills
- Annealing Plants
- Petroleum
- Petro-chemical
- Canneries

. . . and many other applications requiring fast, safe and sure "quick" couplings.

*The Best Connections in the World*

DESIGNED • MARKETED BY AIRATERRA

620 PAULA AVENUE • GLENDALE 1, CALIFORNIA




tact rolls can be easily changed and the pinch roll feed is infinitely variable.

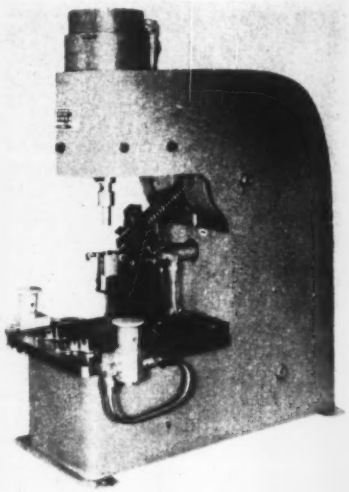
The machine can be equipped for wet or dry operations as well as oil spray or mist coolant systems.

For more information, *write* Acme Mfg. Co., 1400 E. Nine Mile Rd., Detroit 20, Mich.

## Bench Type Driver Has Automatic Feeding

THE ADVANTAGES of automatic feeding of all production parts and the convenience of a bench type driver are combined in the Hopperal Driver. It will feed screws, nuts, bolts, rivets, nails, and other fastening devices.

The feeder provides a continuous supply of parts for the assembly operation without the disadvantages of overfeeding and back pressure. It selectively orients the parts in the inner track and feeds the parts to the outer track for use in the assembly operation.



The unit may be equipped with a solenoid, air, or hydraulic powered driver which is used to drive, peen, press, or stake the part being fed into the assembly. The automatic unit shown is equipped to feed and drive a brass stud into a small stamping.

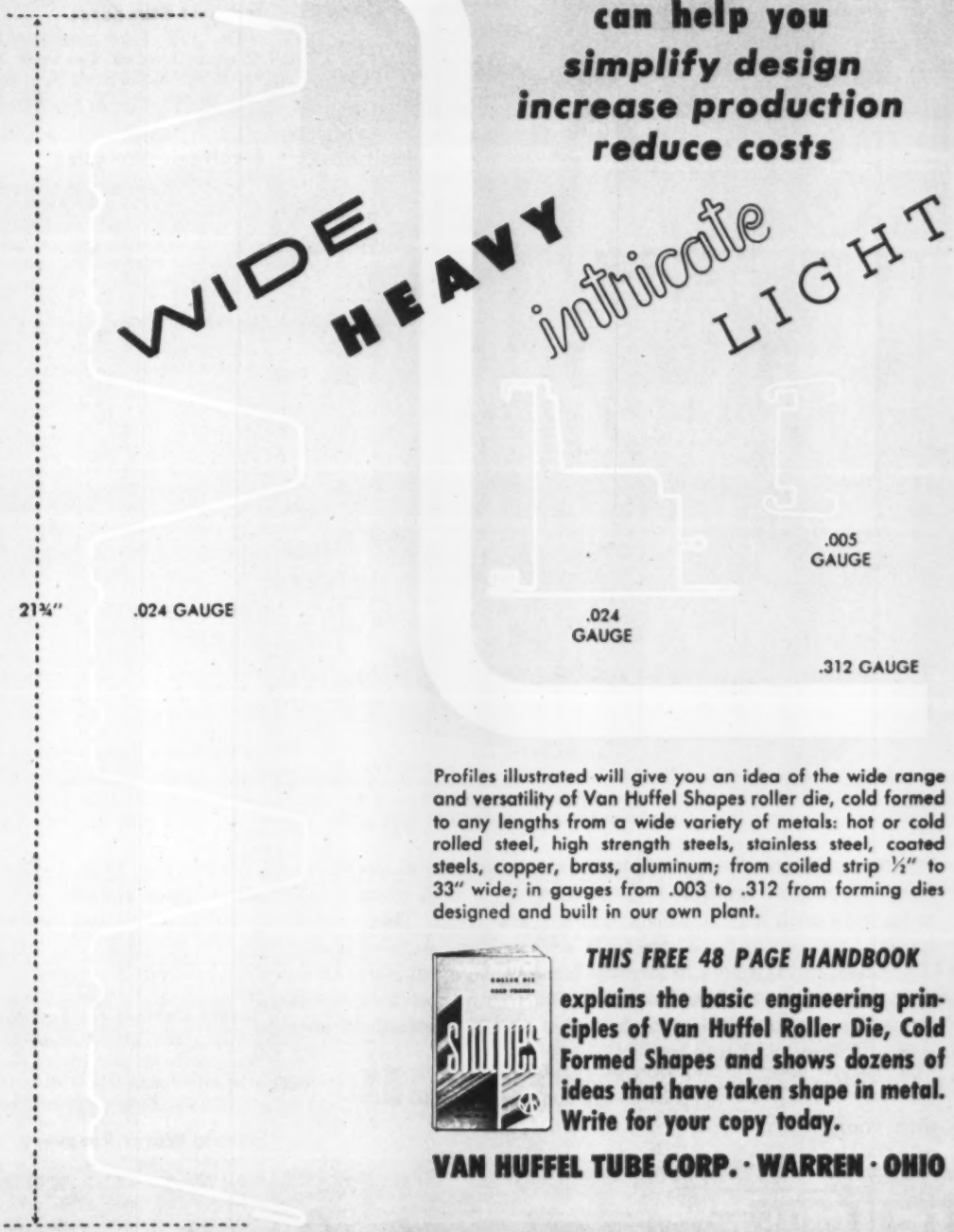
For more information, *write* Haberstump-Harris Inc., 10463 Northlawn Ave., Detroit 4, Mich.

# van huffel

ROLLER DIE COLD FORMED

# metal shapes

**can help you**
***simplify design***
***increase production***
***reduce costs***




Profiles illustrated will give you an idea of the wide range and versatility of Van Huffel Shapes roller die, cold formed to any lengths from a wide variety of metals: hot or cold rolled steel, high strength steels, stainless steel, coated steels, copper, brass, aluminum; from coiled strip ½" to 33" wide; in gauges from .003 to .312 from forming dies designed and built in our own plant.



***THIS FREE 48 PAGE HANDBOOK***

**explains the basic engineering principles of Van Huffel Roller Die, Cold Formed Shapes and shows dozens of ideas that have taken shape in metal. Write for your copy today.**

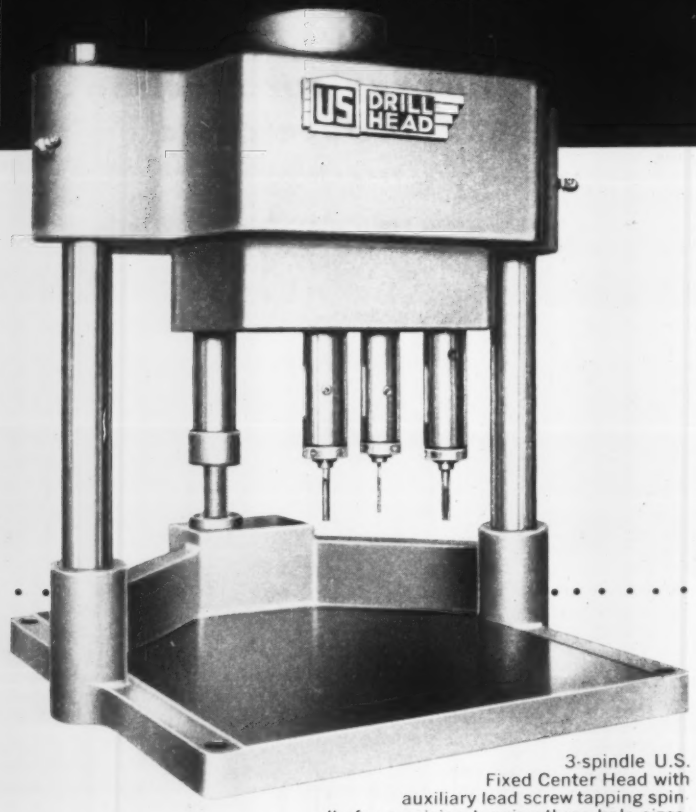
**VAN HUFFEL TUBE CORP. · WARREN · OHIO**

**where ideas take shape in metal**

Get low-cost

# MULTIPLE-HOLE LEAD SCREW TAPPING ON A DRILL PRESS

with U.S. Heads




3-spindle U.S. Fixed Center Head with auxiliary lead screw tapping spindle for precision tapping three hole sizes.

Whether on high or low production runs, you can do precision tapping of multiple-hole patterns on a drill press *at low cost* with a U. S. Master Lead Screw Head. These special fixed center heads are built with varying number of spindles and tap sizes in any one head—with exact gear ratio required to each spindle as well as to master lead screw. Use on any drill press having a reversing spindle.

The cost-reducing production of precision multiple-hole patterns is OUR BUSINESS! Ask our engineers to talk with yours.

US DRILL HEAD

Adjustable and Fixed Center Multiple Drilling Heads.
Individual Lead Screw Multiple Tapping Heads.

UNITED STATES DRILL HEAD CO.

BURNS STREET • CINCINNATI 4, OHIO


# NEW literature

Write directly to the company for a copy

### Aluminum-Bronze Dies

"Ampco for Forming and Drawing Dies," 8 pages, describes the advantages of aluminum-bronze forming and drawing dies. Ampco Metal Inc., 1745 S. 38th St., Milwaukee 46, Wis.

### Index of Standards

The 1959 Price List and Index of American Standards lists more than 1800 standards. Dept. PR 66, American Standards Association, 70 E. 45th St., New York 17, N. Y.

### Electronic Weighing

"Industrial Weighing Through Electronics," 12 pages, explains the development of electronic weighing, operation, economic considerations, and general data for instrumentation and remote recording. Streeter-Amet Co., Grayslake, Ill.

### Lathe Catalog

The complete line of Delta industrial metal lathes is described in a 20-page catalog. Delta Power Tool Div., Rockwell Mfg. Co., 457 N. Lexington Ave., Pittsburgh 8, Pa.

### Capacity Load Graphs

Pipe, I-beam, and channel load capacity graphs help to determine beam load or column load capacity of various sizes of materials. Tube-Strut Corp., 2960 Marsh St., Los Angeles 39, Calif.

### Smelting-Refining Process

A booklet describes the Strategic-Udy process which can smelt economically simple iron ores and complex ores. It presents estimated capital and operating costs. Koppers Co. Inc., Pittsburgh, Pa.

### Adjustable Speed Drives

A bulletin, No. GB-3, describes a complete line of adjustable speed drive equipment for industrial applications. Dynamatic Div., Eaton Mfg. Co., Kenosha, Wis.

### Chain Data Bulletin

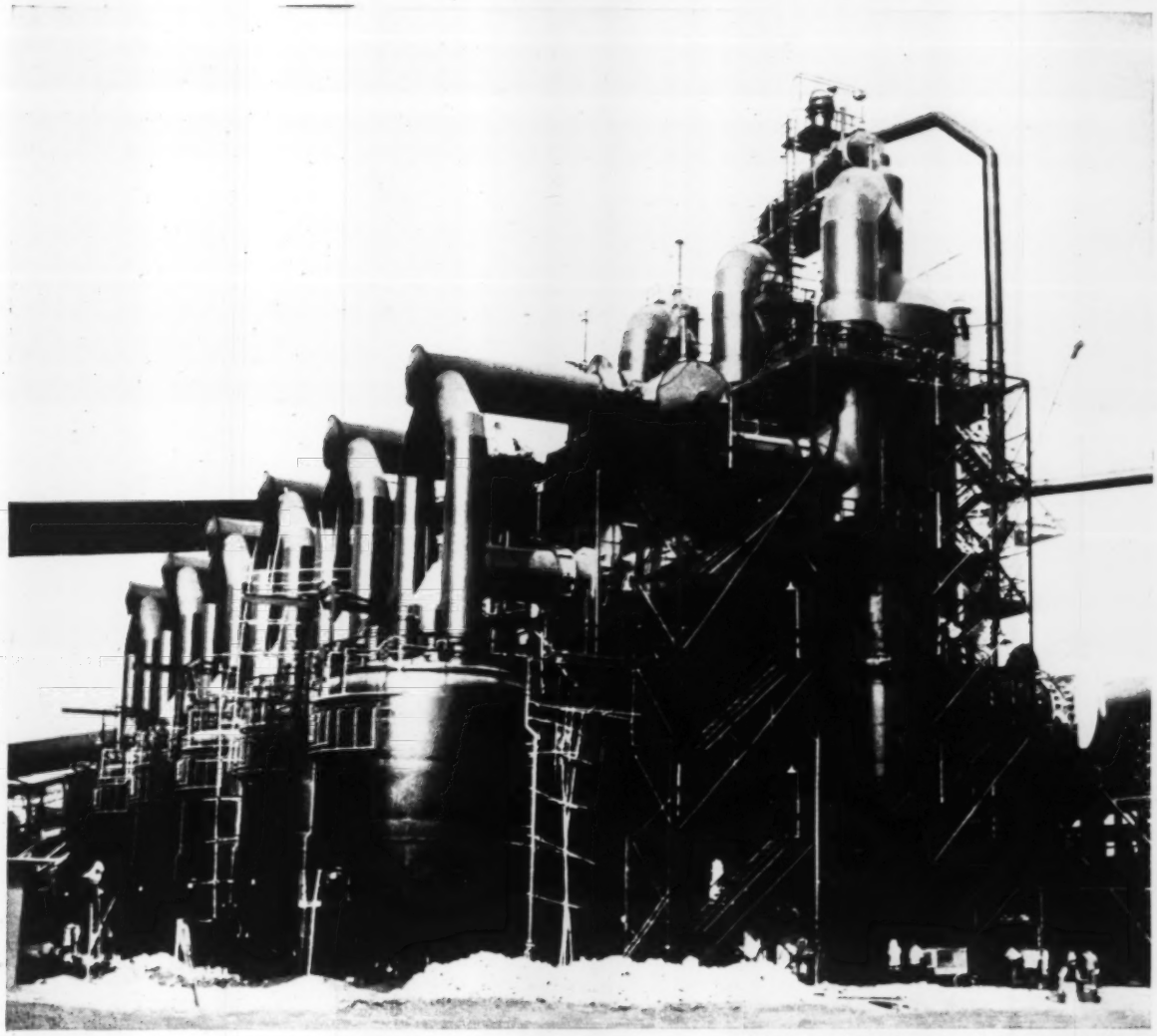
A chain sample book (Bulletin 59) illustrates most sizes of 17 types of welded and weldless chain. S. G. Taylor Chain Co. Inc., Hammond, Ind.

### Insert Cutters for Boring

Report No. 576 tells how honing cost was reduced 60 per cent by modifying a tool cartridge to take a throwaway insert cutting tool. Kennametal Inc., Latrobe, Pa.

### Waste Water Recovery

With proper treatment, waste water from metal finishing plants can be recovered and re-used. Two nomographs help you evaluate such treatments in terms of savings. Graver Water Conditioning Co., 216 W. 14th St., New York 11, N. Y.



TATA Iron & Steel Company, Jamshedpur, India

## World's Largest Blast Furnace Precipitator Installation by Research-Cottrell

This huge new electrical precipitator installation is designed to clean 350,000 cfm total gas from three blast furnaces with 96.7% efficiency. The gas is used primarily for preheating the stoves and underfiring coke ovens. It is also used for boiler firing, soaking pits and open hearths. This is part of a new expansion program designed and built by Kaiser Engineers for TATA.

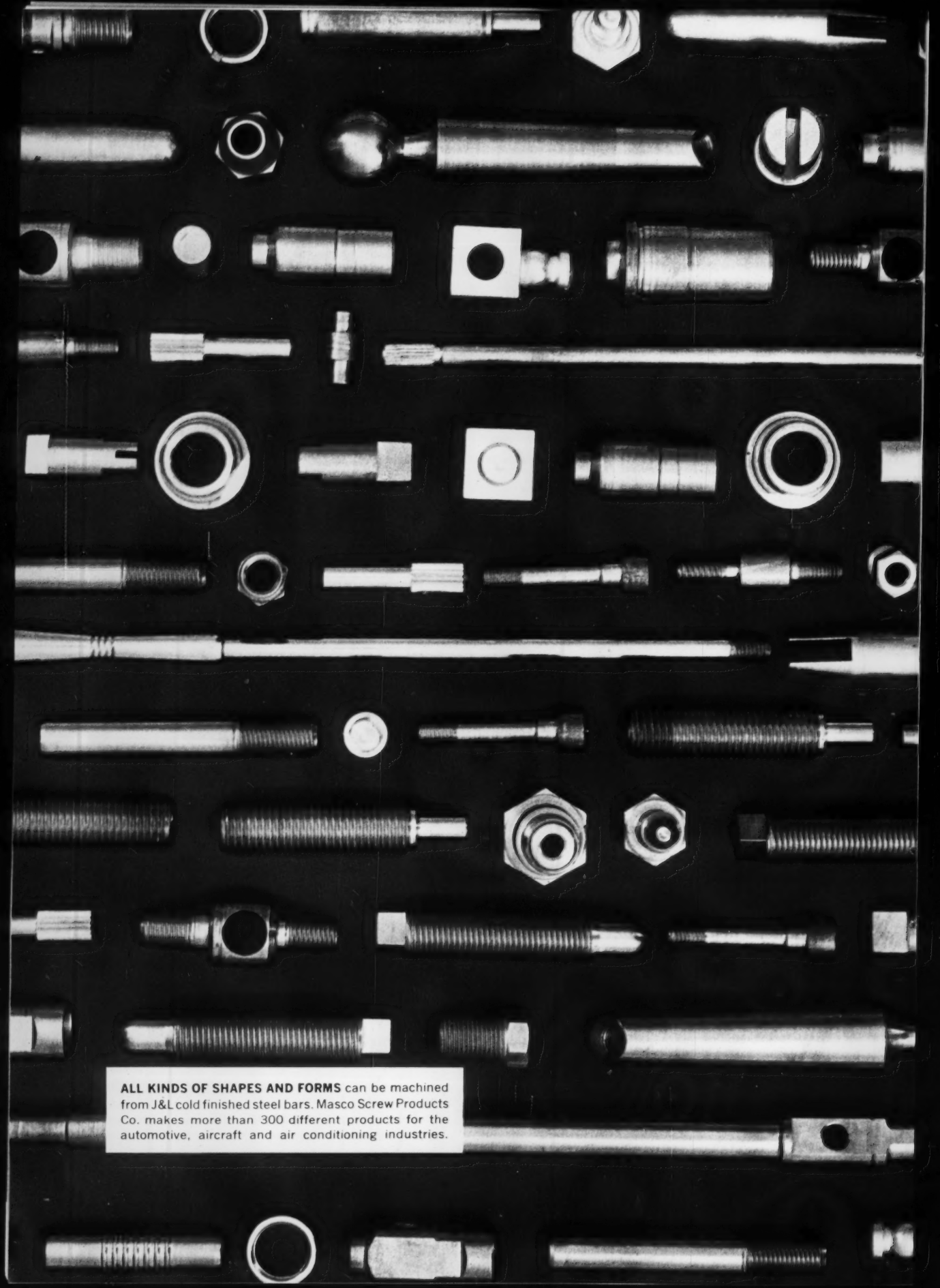
In addition to this new installation, five other Research-Cottrell precipitators still operating at this plant were installed in 1939 to clean 270,000 cfm with 97% efficiency for three blast furnaces.

If you want this kind of reliable operation, call your nearest Research-Cottrell representative. He will be glad to discuss your requirements.

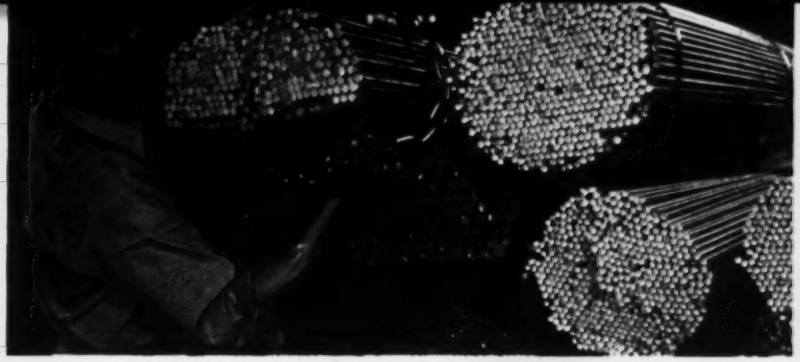
# Research-Cottrell, Inc.

Main Office and Plant: Bound Brook, New Jersey

RC 201 District Offices and Representatives in principal cities of U. S. and Canada



**ALL KINDS OF SHAPES AND FORMS** can be machined from J&L cold finished steel bars. Masco Screw Products Co. makes more than 300 different products for the automotive, aircraft and air conditioning industries.



Detroit's Masco Screw Products Company uses round, square and hexagonal J&L leaded steel bars in sizes from ⅜" to 1⅛"

More than 96 automatic screw machines are in almost constant operation

Production runs vary from less than 10,000 to more than 2,500,000 pieces

Even complex machining operations have fewer work stoppages with free machining J&L leaded steel

Parts are often so smooth after routine machining that no further finishing is necessary

Rigid Masco inspection procedures assure products of dependable quality

Masco regularly handles specifications calling for dichromate, chromium, and other protective coatings

# "J&L leaded steel bars machine at maximum practicable speeds for screw machines"

*. . . reports Masco Screw Products Company*

"While we're seldom able to run our automatic screw machines at their maximum rated speeds, we've found that J&L leaded steel bars permit the fastest machining speeds practicable," says Alex Wood, plant engineer of Masco Screw Products Company, Detroit's largest independent manufacturer of screw machine products.

"The free machining properties of this J&L cold finished steel permit high speed production. The short length chips minimize tool edge build-up. Tool wear is reduced. And, frequently, fewer finishing operations are needed.

"This is a good steel for screw machine products."

**Jones & Laughlin Steel Corporation**

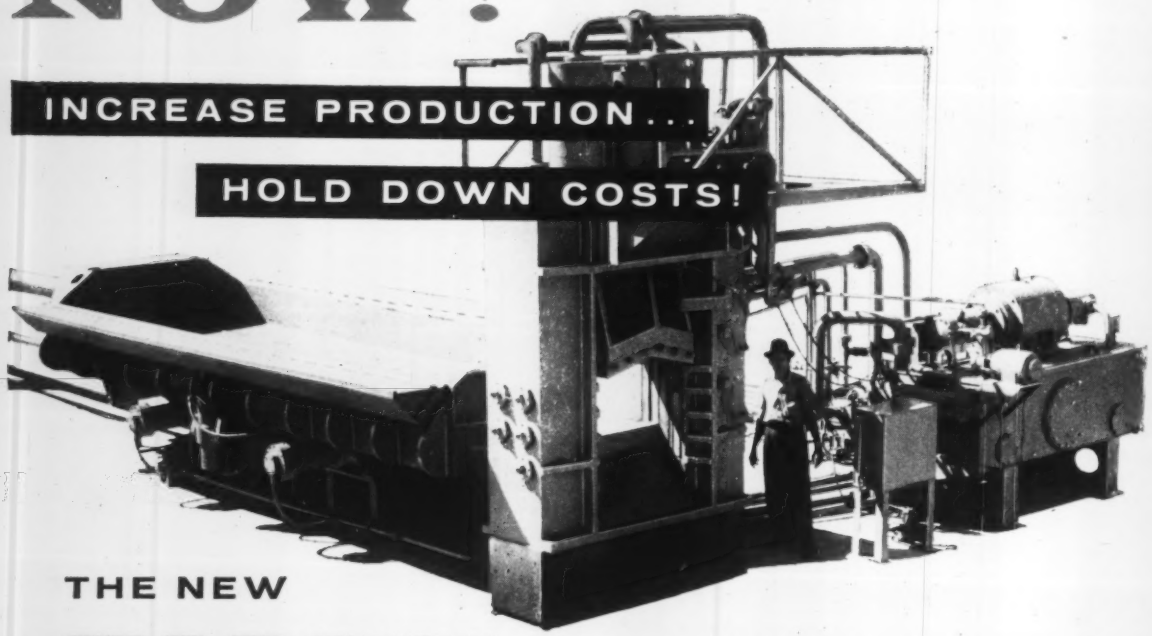
PITTSBURGH, PENNSYLVANIA

*Where cold rolled steels originated in 1859*

# MODERNIZE NOW!

**INCREASE PRODUCTION...**

**HOLD DOWN COSTS!**



THE NEW

## HARRIS BS-350 BALER-SHEAR

**AUTO FRAMES** and bulky scrap work through easily. The Harris Baler-Shear was designed to eliminate problems arising from the preparation of bulky scrap. It incorporates the principles of baling and shearing.

**SPECIFICATIONS**

| | |
|---|---|
| size of charging box | 264 x 83 x 41" |
| shear opening height | 20" |
| shear opening width | 36" |
| shear force | 350 tons |
| floor space required | 55' x 20' |

**HARRIS FOUNDRY & MACHINE CO.**

*Hydraulic Engineers Since 1889*

CORDELE, GEORGIA

*Talk with a Man from Harris*

June 15, 1959

# Steelmakers Shipping at Record Rate

STEEL SHIPMENTS are continuing at a record rate as the July 1 strike deadline approaches.

Mills are pushing finished products out of their doors at capacity. If they can keep it up for the next two weeks, June shipments will match or exceed last month's record of 8.9 million tons.

A few weeks ago, market analysts were guessing that this month's shipments would fall back to the April level (8.6 million tons). Although current performance is better than expected, the odds still favor their prediction. Reasons:

1. Steelmakers will have to start banking their furnaces and trimming production schedules soon unless there's a turn for the better in labor contract negotiations.

2. Overworked equipment may have to be taken out of service for repairs or maintenance.

3. Slowdowns or wildcat strikes may hamstring production.

4. Shippers may be stymied by shortages of trucks or railroad cars.

**SEMIFINISHED STOCKS FALL—** With shipments running well ahead of production, steelmakers have nearly exhausted the stocks of semifinished material they accumulated in anticipation of strike hedging. Unless it suddenly becomes clear that there isn't going to be a walkout, mills won't start processing anything they can't finish before June 30. Sheet coils would rust if they were stored for an extended period.

**DELAYS IN SHEETS, PLATES—** Steelmakers in the Chicago area are about a month behind schedule on deliveries of sheets and plates. One company offered to ship plates from its eastern mills if customers would pay the freight differential, but it had few takers. Pittsburgh producers are only seven to ten days behind on sheets. In the East, it's believed that sheet carryovers will average two to three weeks by June 30.

**JULY OUTLOOK BRIGHTENS—** July bookings for sheets are moderately encouraging, but there's little doubt that some users are ordering only to assure themselves of fast service after a strike. Most eastern mills are booked through July on the popular grades. A Chicago steelmaker is fully committed for August. If a walkout is avoided, mills may be asked to postpone shipment of about 15 per cent of the July tonnage. Because flat-rolled steel is being consumed at a high rate, user inventories won't be big enough to eliminate the need for substantial shipments in the third quarter. Hot-rolled bar producers will operate close to capacity in July if they can start the month with a week's carryover from June and if all the new orders stay on the books.

**GALVANIZERS RIDING HIGH—** More galvanized sheets were shipped in April (328,759 tons) than in any previous month in history. Shipments in the first four months of the year were 1.2 million tons. If there's no slackening of the pace, 1959 shipments will be a record breaking 3.6 million. Best previous outturn was in 1956 (2.96 million). Producers are sold out for July, but some are still taking orders for August. Capacity operations are expected throughout 1959.

**PRODUCTION HOLDS—** Last week's production was unchanged from the previous week's 2,661,000 ingot tons. Steelmakers continued to operate their furnaces at 94 per cent of capacity.

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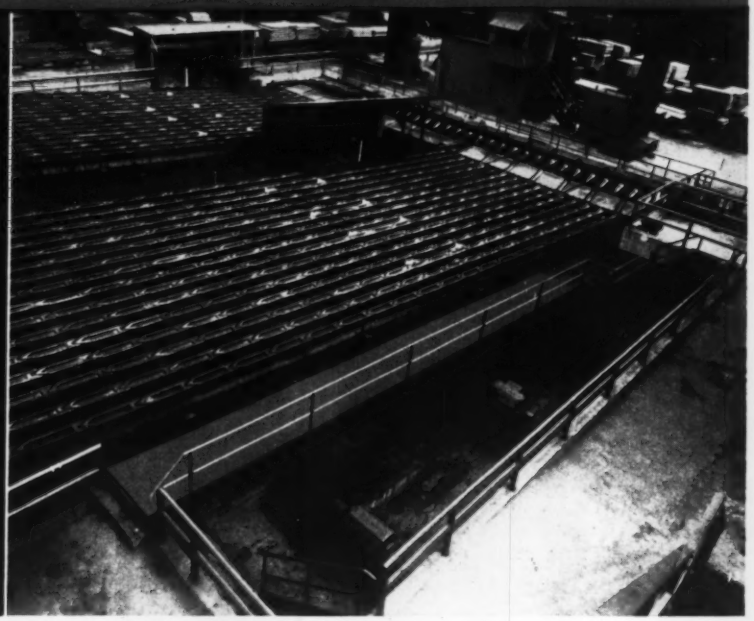
*Current prices were published in the June 8 issue and will appear in subsequent issues.

Metalworking Outlook—Page 79 Technical Outlook—Page 141

# TREADWELL COOLING BED

**built in tandem, each over 100 ft. long. Each bed will cool 125 tons of 4" x 4" steel per hour.**

For heavy duty and efficient production, this steel company called on Treadwell Engineers. The result are these Treadwell Cooling Beds efficiently operating day in and day out. If you have a machinery problem, call on Treadwell Engineers.



**Pictured above: Treadwell Cooling Beds at work in an eastern steel mill.**

## TREADWELL

ENGINEERING COMPANY • EASTON, PA.

SALES AND ENGINEERING OFFICES:

**208 S. LA SALLE STREET**
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**140 CEDAR STREET**
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**WOrth 4-3344**

**1015 FARMERS BANK BLDG.**
**PITTSBURGH 22, PA.**
**ATlantic 1-2883**

Manipulators, Mill, etc.
Mills, Billet, Merchant & Bar
Mills, Rod
Special Machinery
Coilers & Reels

Conveyors, Coil
Drives & Pinions
Ejectors, Furnace
Gauges, Shear, Saw, etc.
Beds, Cooling

Mills, Vertical Edging
Tables, Mill
Tables, Tilting & Lift
Tables, Transfer
Transfers

Beds, Inspection
Bumpers, Furnace
Pushers, Furnace
Repeaters
Handling Equipment (Kick-offs, Pilers, Cradles, etc.)

CASTINGS—Electric Furnace Steel, Ductile Iron, Gray Iron and Ni-Hard

# Lake Ports Get More Foreign Steel

## Great Lakes Ports of Entry

(Week ended May 30, net tons)

| Products & Sources | Chicago | Cleveland | Detroit |
|---|---|---|---|
| **PIPE from:** | | | |
| France | 139.0 | 8.0 | .... |
| **STRUCTURAL ITEMS from:** | | | |
| France | 218.0 | .... | 81.3 |
| Italy | 6.5 | .... | .... |
| Belgium | 3,915.89 | 71.33 | 57.5 |
| Germany | 126.0 | .... | .... |
| **STEEL BARS from:** | | | |
| France | 1,099.0 | 99.99 | .... |
| Norway | 2,182.0 | .... | .... |
| Germany | 3,860.0 | .... | .... |
| Belgium | 1,272.9 | 217.87 | 44.9 |
| England | .... | 10.90 | 258.0 |
| Sweden | .... | 10.91 | 7.0 |
| **STEEL WIRE from:** | | | |
| France | 23.0 | 549.5 | .... |
| Germany | 20.9 | .... | 20.9 |
| Belgium | 27.17 | .... | .... |
| England | .... | 26.67 | .... |
| **WIRE RODS from:** | | | |
| England | 1,122.0 | .... | .... |
| Belgium | 1,098.79 | .... | .... |
| Germany | 930.0 | .... | .... |
| **NAILS & STAPLES from:** | | | |
| England | 13.0 | .... | .... |
| Germany | 2.57 | .... | .... |
| **BOLTS, NUTS, ETC. from:** | | | |
| England | 7.54 | 10.05 | .... |
| Holland | 15.0 | .... | 43.0 |
| Germany | 60.58 | .... | 1.5 |
| Sweden | .... | 42.69 | .... |
| Italy | .... | .... | 18.0 |
| Belgium | .... | .... | 44.5 |
| France | 114.51 | .... | .... |
| **STEEL PLATES from:** | | | |
| Belgium | 1,039.06 | .... | .... |
| France | .... | .... | 17.5 |
| **GALVANIZED WIRE from:** | | | |
| Belgium | 170.0 | .... | .... |
| Germany | 10.5 | .... | .... |
| **SHEETS from:** | | | |
| Germany | .... | .... | 536.4 |
| **GALVANIZED SHEETS from:** | | | |
| France | .... | .... | 441.6 |
| **STEEL RAILS from:** | | | |
| Belgium | 92.8 | .... | .... |
| **BARBED WIRE from:** | | | |
| Germany | .... | .... | 41.5 |
| **ALL OTHER STEEL PRODUCTS . .** | 2,747.07 | 7.45 | .... |
| **TOTALS** | 20,313.78 | 1,055.36 | 1,613.60 |

FOREIGN steel is entering Great Lakes ports via the St. Lawrence Seaway in little more than a trickle, but steelmen, particularly the operators of service centers, fear the trickle may become a flood before long.

They say that given the right set of market conditions and the elimination of some present disadvantages of ocean shipping (traffic congestion at the Seaway and Welland Canal and inadequate port facilities), import volume is bound to rise, especially after domestic consumers become familiar with trading procedure and customs red tape.

Since the opening of the Seaway several weeks ago, steel imports have increased appreciably over those of recent years. They were noticeably heavy during May but have tapered off some this month. But if there's a steel strike next month, it's believed foreign steel will get a play from many supply-pinched manufacturers who hadn't considered imports in their procurement plans.

• **Prices Are Attractive**—A survey of ocean freight rates shows that most European steel products can be shipped to Great Lakes ports at the same prices as to North Atlantic ports (see Page 199). Because of lower labor costs, European steelmakers can undersell U. S. producers by as much as $40 a ton anytime they choose. Not only are their base prices lower, but their extras do not run as high as those charged by U. S. companies.

Prices of imported steel have tended to rise at coastal ports in recent weeks, and the trend is expected to continue so long as demand expands. However, British prices were cut $2.80 a ton (about 2 per cent) June 1 on shipments of 10 tons or more. It is a long term measure, aimed at inducing buyers to increase the size of their orders.

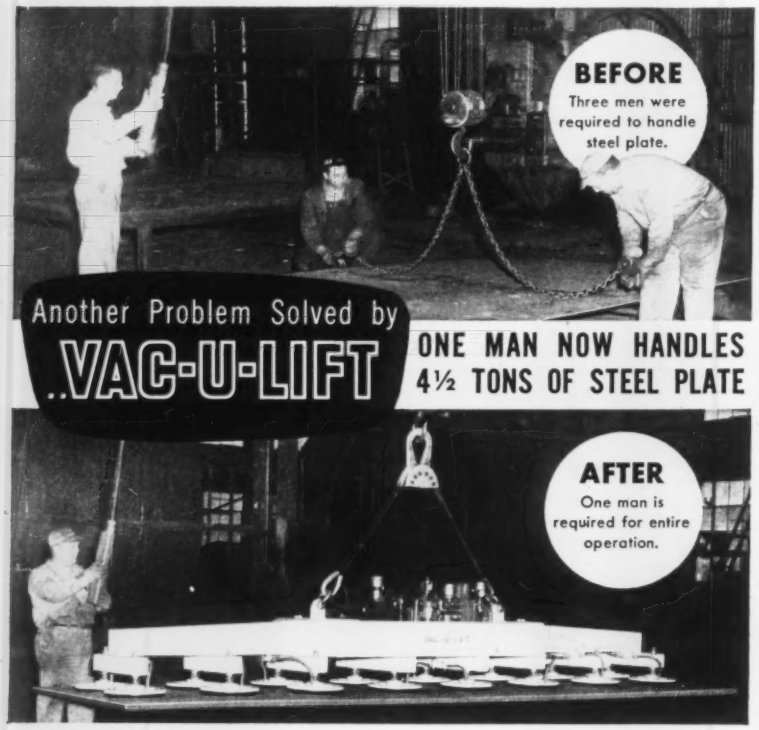
• **Ports of Entry**—European steel is entering ports all along the Great Lakes route, but the bulk of it is going to Chicago, Cleveland, Detroit, Buffalo, and Milwaukee. Chicago appears to be the favorite port of entry. Most of the tonnages are

small, and the product mix, though broad, largely runs to wire items and reinforcing steel (see table). Shipments of heavy structurals, plates and sheets have been limited.

Generally, foreign steel is ordered through established importing houses, chiefly in New York. But there is also some direct dealing with foreign steelmakers. Importers largely do business by long distance telephone, though in some cases they have established sales agencies in Great Lakes ports.

Domestic distributors are disturbed by rumored plans of foreign steelmakers to establish mill depots at strategic spots in the Great Lakes region. They would duplicate service at some Gulf of Mexico ports. The depots would carry standard sizes, largely overcoming some of the disadvantages attending the winter freezeup of the Seaway and the lakes.

All the foreign steel coming into the Great Lakes area appears to be from Western Europe. The major country of origin seems to be West Germany, but Belgium, France, and Britain are sending substantial tonnages.



BEFORE
Three men were required to handle steel plate.
Another Problem Solved by
..VAC-U-LIFT
ONE MAN NOW HANDLES 4½ TONS OF STEEL PLATE
AFTER
One man is required for entire operation.

Photographs shown above demonstrate clearly the tremendous strides taken in vacuum handling. Prior to installation of VAC-U-LIFT plate handler, the lifting operation required 3 men for operation of crane and attaching chains. The VAC-U-LIFT unit requires only one man for complete operation which means faster, safer and more economical steel plate handling. This unit lifts and conveys over 4½ tons of steel plate and is adaptable for use with overhead traveling crane, boom crane and stiff-leg crane. It is also suitable for handling concrete slabs, smooth stone, glass, and all flat metal sheets. Variations of this unit (through rearrangement of the 16 VAC-U-PADS) allow this unit to lift steel angle irons, pipe, "I" beams, and other heavy, unwieldy steel material.

***VAC-U-LIFT SYSTEMS** quickly, economically and safely solve difficult handling problems regardless of weight, shape or size.*

SEND TODAY FOR *FREE* ILLUSTRATED BROCHURE

This brochure shows some of the many VAC-U-LIFT systems now in use. It explains how VAC-U-LIFT works and how you can take advantage of VAC-U-LIFT'S 3-step analyzation service without cost or obligation, write

DEPT. VL-49

VAC-U-LIFT CO. Salem, Illinois


## Mexican Fluorspar Cargo Moved via the Seaway

Bethlehem Steel Co.'s Lackawanna plant has received its first cargo via the St. Lawrence Seaway—4242 tons of fluorspar shipped from Tampico, Mexico. Another fluorspar cargo is scheduled to arrive within a few weeks.

## Sheets, Strip . . .

Sheet & Strip Prices, Pages 194 & 195

Most of the sheet mills are booked up through July on the major grades. But what will happen next month hinges on whether there's a steel strike. If a strike is called, production will drop sharply; if a peaceful settlement is reached, output will be fairly well sustained.

Current consumption is running ahead of expectations. So inventories will not be as heavy as consumers had planned. The situation will modify requests for deferments and cancellations if a strike is averted. However, it's thought that if a strike's avoided, consumers may ask to postpone shipment of 5 to 15 per cent of the steel they've ordered for July delivery.

One Pittsburgh district sheetmaker is only a week behind schedule on deliveries of hot rolled and cold rolled sheets. Its orders for July are "pretty decent," but there's little doubt that some users are ordering only to assure themselves of fast service after a strike.

It's thought there may be a final spurt in business at the end of this month if consumers abandon hope of a peaceful settlement of the steel labor talks. August tonnage is coming in at a normal rate. There's no pressure because users have until the end of this month to order.

Galvanized sheets are sold out for June and July, but orders are still being taken for August. Producers expect capacity operations until the end of the year. Some look for record output.

The carryover in sheets at the end of this month will probably be the heaviest of the major products. In most cases arrearages on cold rolled will average two to three weeks.

One mill has blanked out July entirely.

Washington Steel Corp., Washington, Pa., has booked a contract for 115 tons of sheets, two lots, from the mobile air material area, Brookley Air Force Base, Alabama.

## Stainless Steel . . .

Stainless Steel Prices, Page 197

A new market has opened up for stainless clad steel. Parish Pressed Steel Div., Dana Corp., Reading, Pa., has an initial run of 1000 stainless clad bumpers for busses made by Mack Trucks Inc., Allentown, Pa.

Stainless clad material is composed of three layers of steel made in the form of a sandwich. Two outer layers are made of stainless steel over a mild steel center. The bumper stock of 0.118 gage, supplied by Allegheny Ludlum Steel Corp., Pittsburgh, is 17.25 in. wide by 108.625 in. long. The Parish organization forms the material in a single stroke on a 132 in., 1000 ton capacity press. The bumper weighs 66 lb when finished.

## Steel Bars . . .

Bar Prices, Page 193

Fair orders for third quarter delivery of carbon bars are being placed, but consumers are not going "overboard." While general opinion is that there'll be a steel strike come July 1, there's still the possibility it may be averted before the deadline, and this is sufficient reason for many users to go slow in ordering ahead. Also, since hedge buying no longer is possible, business is slower than it was recently.

Some mills are practically current on shipments, but others are behind a week or so. Arrearages at the end of the month will probably extend more than a week because production is likely to start tapering, especially if no agreement between the steelworkers' union and management seems likely.

A Pittsburgh producer of hot bars expects to operate close to capacity in July if there is no strike and if all his orders stay on his books. New orders alone justify a 60 per cent rate, and the carryover from June will make up the difference.

All the tonnage scheduled for June shipment will probably be rolled this month, but it may not be shipped. Barring unforeseen labor problems (slowdowns and wildcat strikes), June shipments should equal or exceed last month's. Although a leading steelmaker could accept more tonnage for July, he's leaving space open so that he can clean up unshipped June orders.

Bookings for August and September are slow. Bar suppliers think August may be the poorest month of the year. Since most consumers have big inventories, sales may not resume their uptrend until October.

A. M. Byers Co., Pittsburgh, has been awarded a contract for 220 tons of chromium-molybdenum alloy bars by the Aviation Supply Office, Philadelphia.

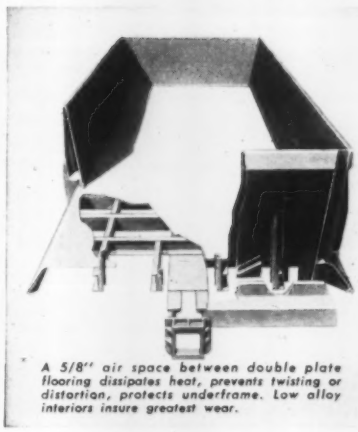
## Reinforcing Bars . . .

Reinforcing Bar Prices, Page 194

Several major tonnages of steel reinforcing bars are awaiting placement in the Pacific Northwest, but except for some small rush orders,


MAGOR AIR DUMP CARS

FOR STEEL PLANT SERVICE

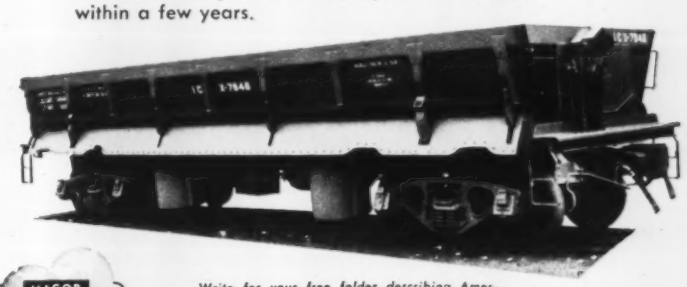


A 5/8" air space between double plate flooring dissipates heat, prevents twisting or distortion, protects underframe. Low alloy interiors insure greatest wear.

The new Magor Air Dump Car for steel plant service can cut your refuse disposal costs as much as 40%! Safe, swift, automatic dumping eliminates expensive labor and crane equipment. Low height and open type body means faster loading. Saves time, labor and haulage costs! Smooth interiors eliminate "dead load" returns!

The double-plate flooring shown here is just one of the many Magor design features that account for Magor's leadership in dump car production. Designed for the job — built to last, Magor Air Dump Cars cost less to buy — less to operate!

Savings effected by the new Magor Air Dump Cars will write off your entire dump car investment within a few years.



MAGOR

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*Handling Coil Stock?*

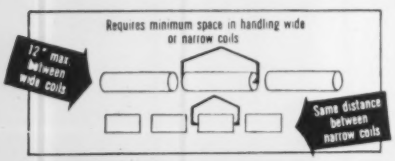
**CHECK THESE**

*C-F LIFTER*

**ADVANTAGES**

- 1 Lifter handles wide range of coil sizes
- Requires minimum of only 10" to 12" between piles —saves storage room
- 1 man operation — eliminates hookers
- Positive grip on coil — no damage to material

• C-F Coil Lifters are saving time and labor in many plants and warehouses because they can pick up, carry and set down a coil of steel faster and safer than any other method. Infinite jaw openings permit handling a very wide range of coil widths . . . carrying legs open fast, stay open until operator closes them on coil. Narrow legs require minimum space between piles – a space saving advantage. Made in motorized models for crane cab or pendant operation as well as manual types with chain wheel, in capacities from 3 tons up. Powered Rotating Heads available. Opening ranges to suit your requirements. Write for illustrated Bulletin.



**CULLEN-FRIESTEDT CO.**

1308 South Kilbourn Avenue • Chicago 23, Illinois


the market is not particularly active in the district. Producers are stressing the early placement of orders because of the threatened steel strike. One large area plant is not actively seeking new business but is speeding deliveries on old orders.

## Tin Plate . . .

Tin Plate Prices, Page 195

Tin plate inventories at mills will be virtually nil by June 30. The product is moving out to canmakers and other consumers about as fast as it is produced. With summer vegetable packs coming on, canmakers can't afford not to be able to satisfy canners' requirements.

## Tubular Goods . . .

Tubular Goods Prices, Page 197

Oil country goods producers are sold out for this quarter on specialty joints, high strength alloys, and smaller sizes of tubing and casing.

June shipments (all products) will be about the same as last month's. It's believed consumers will have taken in enough steel by June 30 to meet their July and August requirements. Because inventories will outlast a 60 day strike, users aren't ordering much tonnage for July and August delivery.

Drill pipe remains dormant even though inventories aren't excessive. Steelmakers say these factors may account for the sluggish demand: 1. Independent drilling contractors are still cannibalizing pipe from their idle rigs. 2. To avoid making capital investments (strings of pipe cost from $50,000 to $70,000 each), they're leasing pipe from others at 1 cent a foot per day. 3. Drill pipe is lasting longer; it's being treated to resist corrosion fatigue, and more drill collars are being used. The few new orders being received by the mills specify immediate delivery. One company lost a sale recently because it couldn't promise to ship within a week.

Shipments of standard pipe are expected to be substantially greater this month than they were in May. A lot of last minute buying is probable if a strike appears inevitable. Reason: Jobbers haven't had the financial resources to invest heavily in inventory. Although they have ample inventories of most sizes, mills may not be able to sort all the orders they receive and load

mixed cars in time for shipment before July 1. If a strike is averted, third quarter sales should be as good as those of the second quarter.

Rotary drilling operations in the U. S. declined in the week ended June 1, Hughes Tool Co.'s survey showing 2166 rigs in operation, down 35 from the preceding week but well above the 1803 in the like week of 1958.

## Tool Steel . . .

Tool Steel Prices, Page 197

Shipments of tool steel (excluding hollow drill steel) totaled 11,621 net tons in April, reports the American Iron & Steel Institute. During March 9584 tons were shipped and in April, 1958, the total was only 5679 tons.

In the first four months this year the movement amounted to 36,325 tons vs. 23,652 in the like period of 1958.

## Structural Shapes . . .

Structural Shape Prices, Page 193

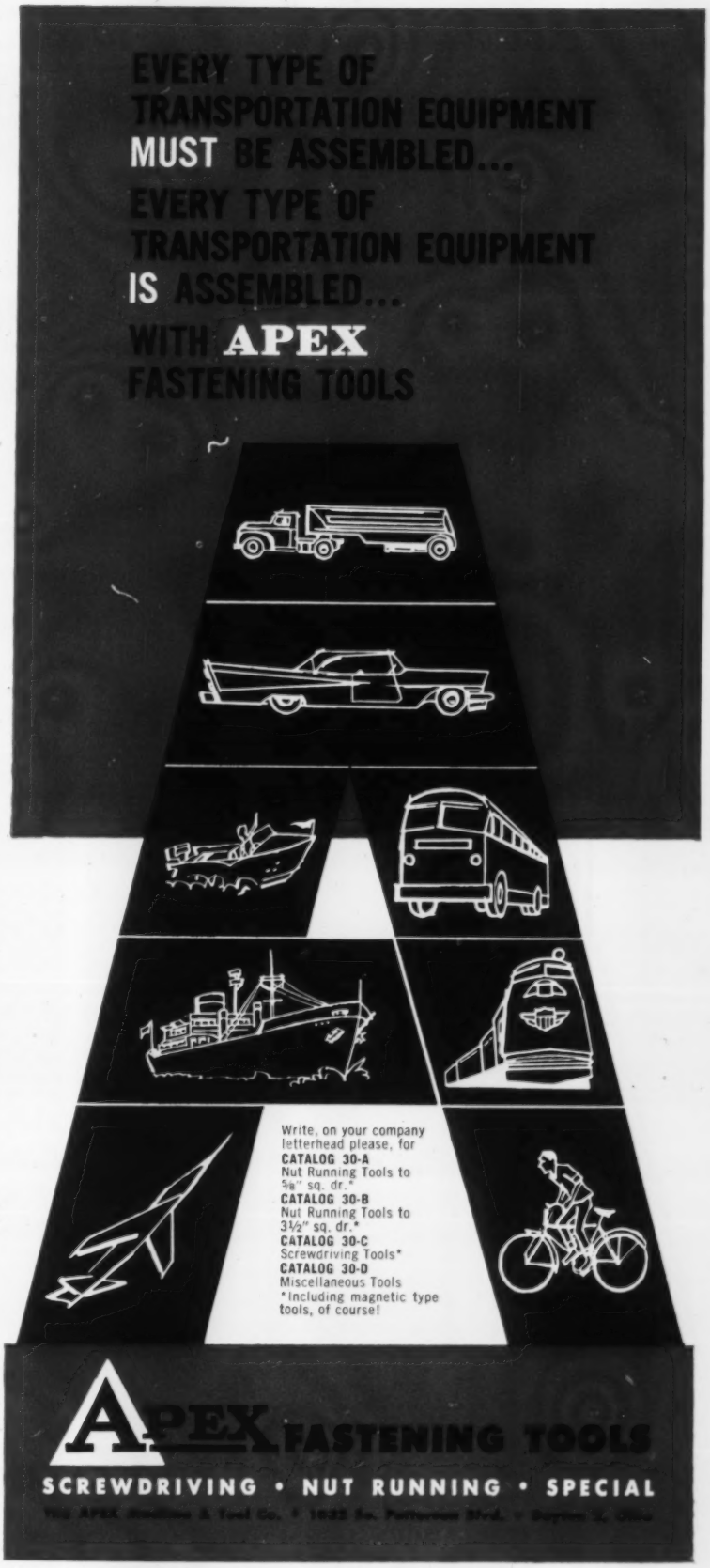
Structural contracting is lagging noticeably in contrast with activity earlier this year when there seemed to be a rush to get work started. It's thought builders, in seeking to beat a possible strike-induced steel shortage this summer, bunched their orders during the spring.

Most of the medium and large fabricating shops are well booked into the fall, and they will have enough steel on hand by the end of this month to keep them going for several weeks. If any supply difficulty is encountered, it will be in wide flange beams.

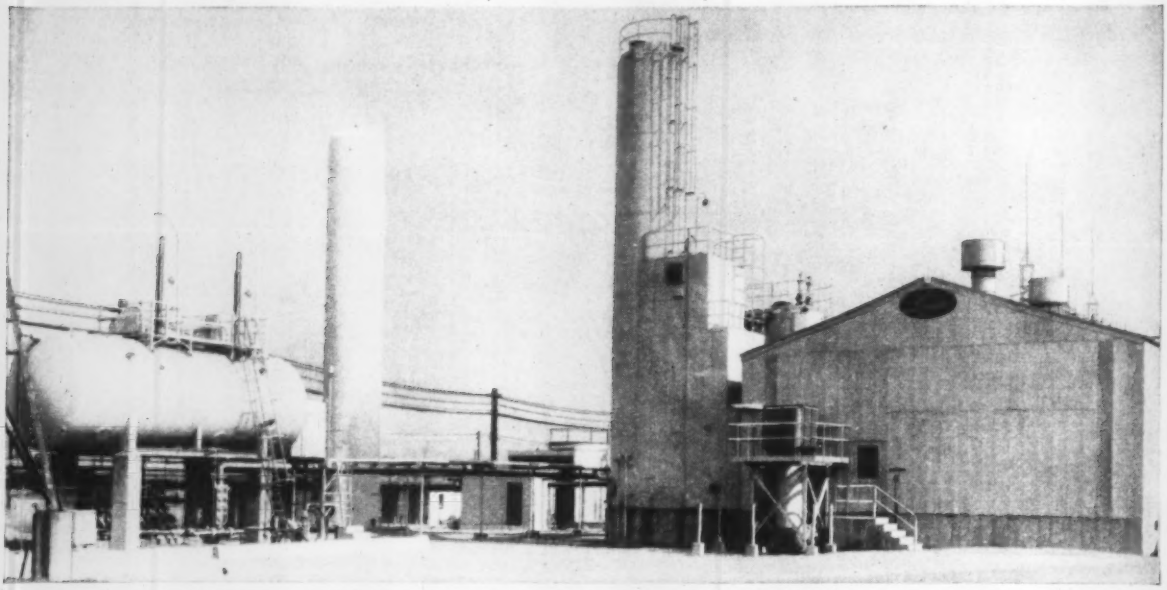
The small shops also are fairly well booked up, and they are reasonably well fixed so far as steel supply is concerned.

The strike which threatens the mills July 1 also threatens various shops at that time, especially the large captives. However, many others, and particularly where different units are involved, will not be immediately affected when the steel strike deadline is reached. Some shops have contracts that don't expire until Sept. 15 or later. The contract of one eastern fabricator runs until the end of the year.

The severity of foreign competition in some lines again is reflected by an Italian bid for 7000 tons of



# *The exciting new J & L sets its pace . . .*



This LINDE On-site Plant is located at J & L's Cleveland Works. Capacity—48,000,000 cu. ft. mo.

## and LINDE helps them keep it!

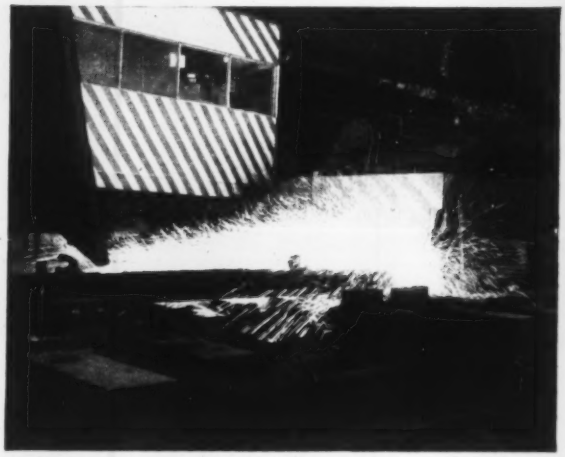
LINDE's Oxygen supply system and scarfing process are geared to production requirements at Jones & Laughlin's Cleveland Works.

All oxygen demands—in the furnace and on the finishing line—are easily handled by LINDE's On-site Plant. BUT . . . intermittent demands require LINDE's flexible supply system—a reliable producing plant PLUS the ability to deliver "peak" and "back-up" requirements from a nationwide liquid oxygen producing and delivery system.

LINDE's supply system and scarfing process meet fluctuations in production as well. When demand dips the oxygen supply is immediately cut back and the LIN-DE-SURFACER Scarfing Machine is regulated or rolled off the line in a matter of minutes.

Whatever the pace set by J & L, LINDE is there right down the line helping to meet the schedule.

For further information, write Dept. S-63, LINDE COMPANY, Division of Union Carbide Corporation, 30 East 42nd Street, New York 17, N. Y. Offices in other principal cities. In Canada: Linde Company, Division of Union Carbide Canada Limited.



A LIN-DE-SURFACER Scarfing Machine, like the one shown here, is used by J & L to condition steel destined for the automotive industry.

The terms "Linde," "Lin-De-Surfacer," and "Union Carbide" are registered trade-marks of Union Carbide Corporation.

Linde

UNION CARBIDE

structurals for transmission towers to link the Niagara and St. Lawrence power projects. The New York State Power Authority reports that Societa Anonima Elettrificazione, Milan, Italy, bid $1,371,451 against $2,166,048 by Bethlehem Steel Co. and $2,265,262 by American Bridge Div., U. S. Steel Corp. The Milan firm has been successful in bidding on similar projects in the past.

In New England, the structural shops have curtailed their steel buying. Most of them are covered on the sizes they'll need through the next two months. Less tonnage is being estimated, but bridgework leads current activity in the district.

## Distributors . . .

Prices, Page 198

Most steel service centers report continuing improvement in June. It's likely that business will surpass May's—the best month so far this year. One Pittsburgh distributor predicts shipments this month will be 25 per cent greater than last month's.

Part of the pickup is attributed to buying for maintenance and repairs, which will be carried on during the vacation period. Part of the bookings is for filling gaps caused by stringency in mill supplies. Scattered bookings are being made as a hedge against the possibility of a steel strike. Distributors believe they will have sufficient stocks to carry them through July in the event of a walkout at the mills.

Most service centers have adopted the new pricing system, but some have misgivings about it. Distributors generally think the method will work out after customers learn how to order. In many cases, the new system will save them money.

## Plates . . .

Plate Prices, Page 193

Third quarter plate buying continues to expand moderately, especially for August and September delivery. Producers have virtually filled July schedules and are running somewhat behind on commitments. If a strike appears inevitable as time goes on, they may enter the third quarter with average arrearages of more than two weeks.

Should a steel strike materalize, orders generally will be pushed back. Should a strike be averted, adjustments in shipping schedules will still be likely since some buyers will ask for deferments and, in some cases, cancellations.

Plate producers are confident of improved business as soon as the labor controversy is settled. Expectations of a pickup in oil and gas requirements are based on expansion plans being developed and on a modest gain in actual orders. Improvement in machine tool and heavy industrial equipment needs is foreseen but tank and boiler requirements are likely to remain spotty for a while. Ship specifications are expected to fall short of the volume reached earlier this year.

## Pig Iron . . .

Pig Iron Prices, Page 198

Merchant iron shipments this month probably will be the heaviest so far this year. But vacations and hot weather will sharply restrict the movement in July and have a retarding influence in August.

Some sellers say it probably will be early fall before business returns to present levels. It may even take longer because part of current buying reflects a disposition to build up excess inventories as a hedge against a possible steel strike next month.

The movement of merchant iron on the Great Lakes is fairly brisk and is expected to remain active at least through June.

Sharon Steel Corp. has banked one of its two blast furnaces at the Roemer Works at Farrell, Pa., to work off a surplus of iron. Iron is being shipped from the Shenango Furnace Co.'s Sharpsville, Pa., blast furnace in hot metal cars to Valley Mould & Iron Corp.'s plant at Hubbard, Ohio, to augment supplies furnished by Youngstown Sheet & Tube Co.

## Semifinished Steel . . .

Semifinished Prices, Page 193

Inventories of semifinished steel products at the mills are narrowing considerably. Steel is being rolled and shipped faster than had been expected. Unless it is clearly indi-


. . . for the right answer to your fastener problems

B

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Cap Screws, Carriage, Machine, Lag, Tap and Plow, Step-Elevator, Stove, High Strength, Anchor, Nylok, SpinLok, Place and Special Bolts

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cated that there will be no strike, the mills shortly will start to withhold steel which can't be completely processed before June 30. For example, coils for sheets can rust if they stand for any length of time. It takes special processing to restore them to rolling condition.

## Iron Ore . . .

Iron Ore Prices, Page 199

Iron ore shipments from Steep Rock Iron Mines Ltd., Steep Rock Lake, Ontario, Can., passed the half-million-ton mark in May, a point that wasn't reached in 1958 until August. At the end of May (this season), 506,383 tons had been shipped.

The largest single consignment of ore in the history of the Chesapeake & Ohio Railway was made recently from Newport News, Va., to Ashland, Ky. The shipment (45,500 tons of Canadian ore) was handled in 70 ton coal hopper cars equipped with six wheel trucks. A large number of cars (662) was needed because the ore is heavy. The load limit (70 tons) was reached when the cars were only half full.

Shipments of Lake Superior iron ore in May totaled 12,765,446 gross tons, up 8,704,845 from the 4,060,601 tons shipped in May, 1958, reports the American Iron Ore Association. The season's movement of ore to June 1, totaling 15,745,231 tons, was up 11,622,070 from the 4,123,161 tons moved in the 1958 lake navigation season to June 1 that year.

## Shipments of Barrels and Drums Rise 15 Per Cent

Movement of steel shipping barrels and drums in March totaled 2,893,000 units, up 13 per cent from February and 15 per cent from March, 1958, reports the Bureau of the Census. First quarter shipments were 8,058,306 units vs. 7,411,810 in the same period last year.

Shipments of steel pails in March totaled 6,639,223 units, an increase of 22 per cent over February, and 23 per cent over March last year. The total for the first quarter was 17,096,437 units vs. 15,407,539 in the corresponding period last year.

## Steel Product Shipments—April, 1959

(Net tons)

| Products | Carbon | Alloy | Stainless | First Four Months 1959 | 1958 |
|---|---|---|---|---|---|
| Ingots | 15,174 | 14,174 | 2,056 | 104,066 | 98,697 |
| Blooms, slabs | 115,732 | 54,237 | 1,581 | 601,966 | 396,610 |
| Tube rounds | 1,381 | 455 | 2 | 6,415 | 2,787 |
| Skelp | 5,349 | ..... | ..... | 17,758 | 29,974 |
| Wire rods | 131,250 | 3,267 | 1,341 | 477,491 | 250,466 |
| Shapes (heavy) | 513,488 | 5,846 | 18 | 1,754,962 | 1,308,919 |
| Steel piling | 48,757 | ..... | ..... | 138,151 | 128,141 |
| Plates | 638,400 | 51,989 | 3,894 | 2,412,330 | 1,843,908 |
| Rails (standard) | 77,547 | ..... | ..... | 300,839 | 206,634 |
| Rails (other) | 5,810 | ..... | ..... | 17,062 | 12,217 |
| Joint bars | 4,531 | ..... | ..... | 13,982 | 14,930 |
| Tie plates | 22,578 | ..... | ..... | 68,355 | 50,792 |
| Track spikes | 7,351 | ..... | ..... | 21,260 | 15,250 |
| Wheels | 28,065 | 50 | ..... | 79,800 | 68,326 |
| Axles | 13,579 | 51 | ..... | 36,476 | 38,317 |
| Bars (hot rolled) | 641,888 | 197,724 | 5,244 | 2,949,651 | 1,629,532 |
| Bars (reinforcing) | 253,741 | ..... | ..... | 765,737 | 541,570 |
| Bars (cold drawn) | 139,511 | 26,311 | 6,195 | 586,792 | 313,950 |
| Tool steel | 2,597 | 9,024 | 11,621 | 36,325 | 23,652 |
| Standard pipe | 274,303 | 134 | ..... | 896,533 | 618,678 |
| Oil country goods | 236,843 | 45,638 | ..... | 919,392 | 381,140 |
| Line pipe | 433,215 | 112 | ..... | 1,189,301 | 826,719 |
| Mechanical tubing | 63,796 | 30,319 | 383 | 318,571 | 175,813 |
| Pressure tubing | 22,906 | 4,527 | 1,160 | 104,235 | 86,126 |
| Drawn wire | 311,520 | 4,689 | 3,597 | 1,044,922 | 692,980 |
| Nails & staples | 46,354 | ..... | 1 | 149,932 | 130,270 |
| Barbed wire | 7,602 | ..... | ..... | 23,207 | 23,297 |
| Woven wire fence | 23,197 | ..... | ..... | 68,859 | 69,084 |
| Bale ties, etc. | 5,950 | ..... | ..... | 25,087 | 13,121 |
| Black plate | 75,763 | ..... | ..... | 254,515 | 206,028 |
| Tin plate HD | 54,906 | ..... | ..... | 156,518 | 141,375 |
| Tin plate—electrq | 689,998 | ..... | ..... | 2,147,241 | 1,766,939 |
| Sheets HR | 915,374 | 34,632 | 6,166 | 3,398,399 | 1,747,956 |
| Sheets CR | 1,502,663 | 5,358 | 15,947 | 5,743,976 | 2,913,368 |
| Sheets—galvanized | 328,759 | ..... | ..... | 1,207,151 | 756,813 |
| Sheets—other | 25,181 | ..... | ..... | 107,969 | 51,662 |
| Elec. sheets, strip | 6,698 | 67,724 | ..... | 251,976 | 148,195 |
| Strip HR | 153,821 | 2,804 | 2,215 | 546,588 | 285,715 |
| Strip CR | 122,671 | 1,788 | 23,624 | 506,660 | 309,696 |
| Total (1959) | 7,968,249 | 560,853 | 73,424 | 29,450,450 | ..... |
| Total (1958) | 4,106,985 | 232,064 | 33,922 | ..... | 18,319,547 |

Data from American Iron & Steel Institute.

### DISTRICT INGOT RATES

(Percentage of Capacity Engaged)

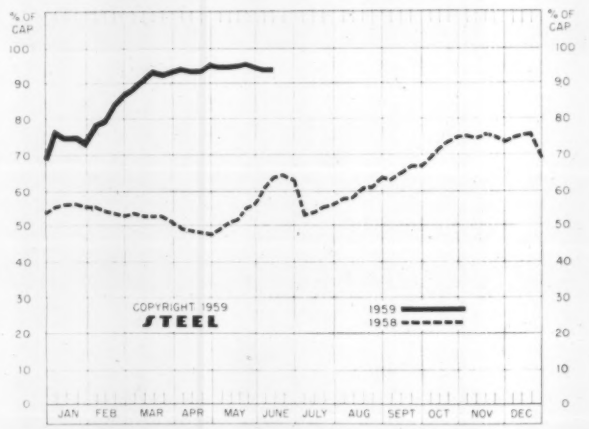
| | Week Ended June 14 | Change | Same Week 1958 | 1957 |
|---|---|---|---|---|
| Pittsburgh | 97.5 | + 1* | 57 | 88 |
| Chicago | 94.5 | 0* | 69 | 87.5 |
| Eastern | 97 | + 1 | 60 | 94.5 |
| Youngstown | 95 | 0 | 50 | 76.5 |
| Wheeling | 90.5 | — 0.5 | 75 | 83.5 |
| Cleveland | 94 | 0* | 45.5 | 89 |
| Buffalo | 107.5 | 0 | 53.5 | 102.5 |
| Birmingham | 97 | 0 | 60.5 | 92.5 |
| Cincinnati | 95 | + 2.5* | 60 | 88 |
| St. Louis | 104 | + 2.5* | 95.5 | 84.5 |
| Detroit | 97 | — 0.5* | 68 | 99 |
| Western | 98 | 0 | 72 | 99 |
| National Rate | 94 | 0 | 64 | 88.5 |

### INGOT PRODUCTION‡

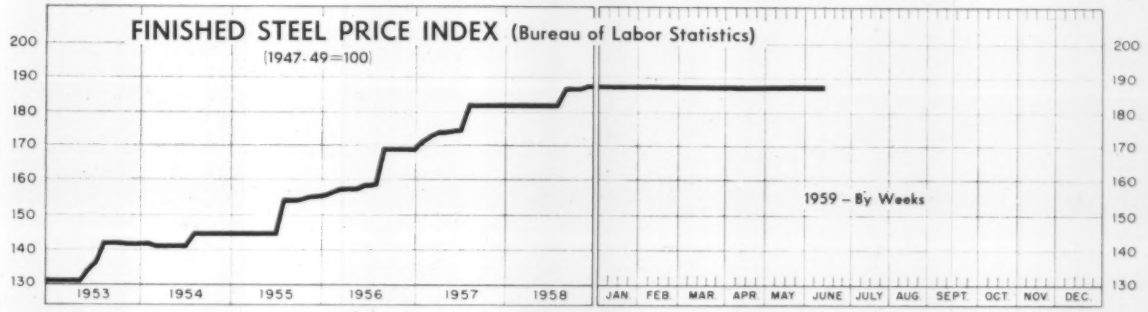
| | Week Ended June 14 | Week Ago | Month Ago | Year Ago |
|---|---|---|---|---|
| INDEX (1947-49=100) | 166.9† | 165.2 | 163.8 | 107.6 |
| NET TONS (In thousands) | 2,681† | 2,653 | 2,631 | 1,728 |

*Change from preceding week's revised rate. †Estimated. ‡American Iron & Steel Institute. Weekly capacity (net tons): 2,831,331 in 1959; 2,699,173 in 1958; 2,559,490 in 1957.

### NATIONAL STEELWORKS OPERATIONS



# Price Indexes and Composites




| June 9, 1959 | Week Ago | Month Ago | May Avg. | Year Ago |
|---|---|---|---|---|
| 186.7 | 186.7 | 186.7 | 186.7 | 181.5 |

## AVERAGE PRICES OF STEEL (Bureau of Labor Statistics)

**Week Ended June 9**

Prices include mill base prices and typical extras and deductions. Units are 100 lb except where otherwise noted in parentheses. For complete description of the following products and extras and deductions applicable to them, write to STEEL.

| | |
|---|---|
| Rails, Standard No. 1 | $5.825 |
| Rails, Light, 40 lb | 7.292 |
| Tie Plates | 6.875 |
| Axles, Railway | 10.175 |
| Wheels, Freight Car, 33 in. (per wheel) | 62.000 |
| Plates, Carbon | 6.350 |
| Structural Shapes | 6.167 |
| Bars, Tool Steel, Carbon (lb) | 0.560 |
| Bars, Tool Steel, Alloy, Oil Hardening Die (lb) | 0.680 |
| Bars, Tool Steel, H.R. Alloy, High Speed, W 6.75, Cr 4.5, V 2.1, Mo 5.5, C 0.060 (lb) | 1.400 |
| Bars, Tool Steel, H.R. Alloy, High Speed, W18, Cr 4, V 1 (lb) | 1.895 |
| Bars, H.R., Alloy | 10.775 |
| Bars, H.R., Stainless, 303 (lb) | 0.543 |
| Bars, H.R., Carbon | 6.675 |
| Bars, Reinforcing | 6.385 |
| Bars, C.F., Carbon | 10.710 |
| Bars, C.F., Alloy | 14.125 |
| Bars, C.F., Stainless, 302 (lb) | 0.570 |
| Sheets, H.R., Carbon | 6.350 |
| Sheets, C.R., Carbon | 7.300 |
| Sheets, Galvanized | 8.615 |
| Sheets, C.R., Stainless, 302 (lb) | 0.658 |
| Sheets, Electrical | 12.625 |
| Strip, C.R., Carbon | 9.489 |
| Strip, C.R., Stainless, 430 (lb) | 0.480 |
| Strip, H.R., Carbon | 6.250 |
| Pipe, Black, Buttweld (100 ft) | 19.905 |
| Pipe, Galv., Buttweld (100 ft) | 23.253 |
| Pipe, Line (100 ft) | 199.533 |
| Casing, Oil Well, Carbon (100 ft) | 201.080 |
| Casing, Oil Well, Alloy (100 ft) | 315.213 |
| Tubes, Boiler (100 ft) | 51.200 |
| Tubing, Mechanical, Carbon (100 ft) | 27.005 |
| Tubing, Mechanical, Stainless, 304 (100 ft) | 205.608 |
| Tin Plate, Hot-dipped, 1.25 lb (95 lb base box) | 10.100 |
| Tin Plate, Electrolytic, 0.25 lb (95 lb base box) | 8.800 |
| Black Plate, Canmaking Quality (95 lb base box) | 7.900 |
| Wire, Drawn, Carbon | 10.575 |
| Wire, Drawn, Stainless, 430 (lb) | 0.665 |
| Bale Ties (bundles) | 7.967 |
| Nails, Wire, 8d Common | 9.825 |
| Wire, Barbed (80-rod spool) | 8.722 |
| Woven Wire Fence (20-rod roll) | 21.737 |

## STEEL's FINISHED STEEL PRICE INDEX*

| | June 10 1959 | Week Ago | Month Ago | Year Ago | 5 Yr Ago |
|---|---|---|---|---|---|
| Index (1935-39 avg=100) | 247.82 | 247.82 | 247.82 | 239.15 | 189.75 |
| Index in cents per lb | 6.713 | 6.713 | 6.713 | 6.479 | 5.140 |

## STEEL's ARITHMETICAL COMPOSITES*

| | | | | | |
|---|---|---|---|---|---|
| Finished Steel, NT | $149.96 | $149.96 | $149.96 | $145.52 | $113.20 |
| No. 2 Fdry, Pig Iron, GT. | 66.49 | 66.49 | 66.49 | 66.49 | 56.54 |
| Basic Pig Iron, GT | 65.99 | 65.99 | 65.99 | 65.99 | 56.04 |
| Malleable Pig Iron, GT | 67.27 | 67.27 | 67.27 | 67.27 | 57.27 |
| Steelmaking Scrap, GT | 35.50 | 35.00 | 33.33 | 35.67 | 28.17 |

*For explanation of weighted index see STEEL, Sept. 19, 1949, p. 54; of arithmetical price composite, STEEL, Sept. 1, 1952, p. 139.

# Comparison of Prices

Comparative prices by districts in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

## FINISHED STEEL

| | June 10 1959 | Week Ago | Month Ago | Year Ago | 5 Yr Ago |
|---|---|---|---|---|---|
| Bars, H.R., Pittsburgh | 5.675 | 5.675 | 5.675 | 5.425 | 4.15 |
| Bars, H.R., Chicago | 5.675 | 5.675 | 5.675 | 5.425 | 4.15 |
| Bars, H.R., deld., Philadelphia | 5.975 | 5.975 | 5.975 | 5.725 | 4.405 |
| Bars, C.F., Pittsburgh | 7.65* | 7.65* | 7.65* | 7.30* | 5.20 |
| Shapes, Std., Pittsburgh | 5.50 | 5.50 | 5.50 | 5.275 | 4.10 |
| Shapes, Std., Chicago | 5.50 | 5.50 | 5.50 | 5.275 | 4.10 |
| Shapes, deld., Philadelphia | 5.77 | 5.77 | 5.77 | 5.545 | 4.38 |
| Plates, Pittsburgh | 5.30 | 5.30 | 5.30 | 5.10 | 4.10 |
| Plates, Chicago | 5.30 | 5.30 | 5.30 | 5.10 | 4.10 |
| Plates, Coatesville, Pa. | 5.30 | 5.30 | 5.30 | 5.10 | 4.10 |
| Plates, Sparrows Point, Md. | 5.30 | 5.30 | 5.30 | 5.10 | 4.10 |
| Plates, Claymont, Del. | 5.30 | 5.30 | 5.30 | 5.10 | 4.10 |
| Sheets, H.R., Pittsburgh | 5.10 | 5.10 | 5.10 | 4.925 | 3.925 |
| Sheets, H.R., Chicago | 5.10 | 5.10 | 5.10 | 4.925 | 3.925 |
| Sheets, C.R., Pittsburgh | 6.275 | 6.275 | 6.275 | 6.05 | 4.775 |
| Sheets, C.R., Chicago | 6.275 | 6.275 | 6.275 | 6.05 | 4.775 |
| Sheets, C.R., Detroit | 6.275 | 6.275 | 6.275 | 6.05 | 4.975 |
| Sheets, Galv., Pittsburgh | 6.875 | 6.875 | 6.875 | 6.60 | 5.275 |
| Strip, H.R., Pittsburgh | 5.10 | 5.10 | 5.10 | 4.925 | 4.425 |
| Strip, H.R., Chicago | 5.10 | 5.10 | 5.10 | 4.925 | 3.925 |
| Strip, C.R., Pittsburgh | 7.425 | 7.425 | 7.425 | 7.15 | 5.45 |
| Strip, C.R., Chicago | 7.425 | 7.425 | 7.425 | 7.15 | 5.70 |
| Strip, C.R., Detroit | 7.425 | 7.425 | 7.425 | 7.15-7.25 | 5.65 |
| Wire, Basic, Pittsburgh | 8.00 | 8.00 | 8.00 | 7.65 | 5.525 |
| Nails, Wire, Pittsburgh | 8.95 | 8.95 | 8.95 | 8.95 | 6.55 |
| Tin plate(1.50 lb)box, Pitts. | $10.65 | $10.65 | $10.65 | $10.30 | $8.95 |

*Including 0.35c for special quality.

## SEMIFINISHED STEEL

| | | | | | |
|---|---|---|---|---|---|
| Billets, forging, Pitts. (NT) | $99.50 | $99.50 | $99.50 | $96.00 | $75.50 |
| Wire rods $\frac{7}{32}$-$\frac{5}{8}$" Pitts. | 6.40 | 6.40 | 6.40 | 6.15 | 4.525 |

## PIG IRON, Gross Ton

| | June 10 1959 | Week Ago | Month Ago | Year Ago | 5 Yr Ago |
|---|---|---|---|---|---|
| Bessemer, Pitts. | $67.00 | $67.00 | $67.00 | $67.00 | $57.00 |
| Basic, Valley | 66.00 | 66.00 | 66.00 | 66.00 | 56.00 |
| Basic, deld., Phila. | 70.41 | 70.41 | 70.41 | 70.41 | 59.66 |
| No. 2 Fdry, NevilleIsland, Pa. | 66.50 | 66.50 | 66.50 | 66.50 | 56.50 |
| No. 2 Fdry, Chicago | 66.50 | 66.50 | 66.50 | 66.50 | 56.50 |
| No. 2 Fdry, deld., Phila. | 70.91 | 70.91 | 70.91 | 70.91 | 60.16 |
| No. 2 Fdry, Birm. | 62.50 | 62.50 | 62.50 | 62.50 | 52.88 |
| No. 2 Fdry(Birm.)deld., Cin. | 70.20 | 70.20 | 70.20 | 70.20 | 60.43 |
| Malleable, Valley | 66.50 | 66.50 | 66.50 | 66.50 | 56.50 |
| Malleable, Chicago | 66.50 | 66.50 | 66.50 | 66.50 | 56.50 |
| Ferromanganese, net ton† | 245.00 | 245.00 | 245.00 | 245.00 | 200.00 |

†74-76% Mn, Duquesne, Pa.

## SCRAP, Gross Ton (Including broker's commission)

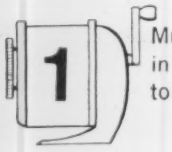
| | | | | | |
|---|---|---|---|---|---|
| No. 1 Heavy Melt, Pittsburgh | $35.50 | $34.50 | $34.50 | $35.50 | $29.50 |
| No. 1 Heavy melt, E. Pa. | 36.00 | 36.00 | 33.50 | 34.50 | 23.00 |
| No. 1 Heavy Melt, Chicago | 35.00 | 34.50 | 32.00 | 37.00 | 32.00 |
| No. 1 Heavy Melt, Valley | 39.50 | 39.50 | 35.50 | 36.50 | 29.50 |
| No. 1 Heavy Melt, Cleve. | 36.50 | 36.50 | 33.50 | 33.00 | 28.50 |
| No. 1 Heavy Melt, Buffalo | 33.50 | 33.50 | 31.50 | 26.50 | 26.50 |
| Rails, Rerolling, Chicago | 58.50 | 58.50 | 55.50 | 54.00 | 44.50 |
| No. 1 Cast, Chicago | 50.50 | 49.50 | 46.50 | 41.50 | 38.50 |

## COKE, Net Ton

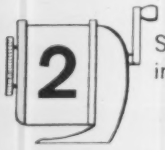
| | | | | | |
|---|---|---|---|---|---|
| Beehive, Furn., Connlsvl. | $15.00 | $15.00 | $15.00 | $15.25 | $14.75 |
| Beehive, Fdry., Connlsvl. | 18.25 | 18.25 | 18.25 | 18.25 | 16.75 |
| Oven, Fdry., Milwaukee | 32.00 | 32.00 | 32.00 | 30.50 | 25.25 |

# 9 WAYS TO SHARPEN YOUR PURCHASING PENCIL

# BY BUYING CARPENTER STAINLESS TUBING AND PIPE

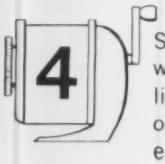



Multiple Lengths. If you order delivery in multiple lengths, you can save up to 3½%.

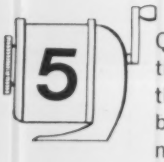



Selected Mill Lengths. Automatic savings from 2% to 5% if so ordered.

Shorts. If you order 90% of your requirement in cut lengths and 10% in short lengths, you can save 5%.

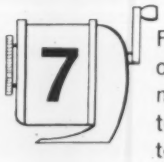



Standard Tolerances. If you order within published standard tolerance limits, you can save up to 12%; in other words, closer than standard tolerances add 6 to 12% to the cost.

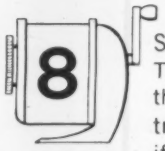



Quarterly Buying. Place your order on the mill for delivery during a specific three month period. This way you will be able to provide material for a three month period and you'll have potential saving through purchasing at a lower cost.

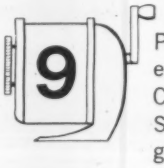
Consider the Next Quantity Bracket. If your requirements for tubing or pipe come close to the upper limits of a quantity bracket, consider future use for this material and jump to the next bracket. Often you will gain several hundred feet of product by jumping to the next bracket at no added per unit cost.




Finish. Recently there have appeared on the market, many conditions of manufacture, ranging from as-welded to full finished. Consider the service to which this tubing or pipe will be applied and consider the few pennies involved for obtaining the best finish compared with the dollars lost by downtime and lost production through use of the cheapest grade available.




Standard Sizes. Carpenter Stainless Tubing and Pipe are made available through a nationwide network of distributors who stock standard sizes, so if you need something quickly you can get it. Don't design equipment, unless it is unavoidable, around other than standard sizes of tubing and pipe.




Performance. To guarantee the greatest operating economy, order from Carpenter. Carpenter WELD-TROL Stainless Tubing and Pipe give you the greatest degree of uniformity available in tubing today. This key factor is your ticket to longer, cost-saving performance. Contact your nearest authorized distributor or write for technical bulletin. The Carpenter Steel Company, Alloy Tube Division, Union, N. J.

*your master key to cost-saving corrosion control*

**Stainless Tubing & Pipe**

# Steel Prices

Mill prices as reported to STEEL, June 10, cents per pond except as otherwise noted. *Changes shown in italics.* Code number following mill point indicates producing company. Key to producers, page 194; footnotes, page 196.

## SEMIFINISHED

**INGOTS, Carbon, Forging (NT)**
Munhall,Pa. U5 .....$76.00

**INGOTS, Alloy (NT)**
Detroit S41 .....$82.00
Economy,Pa. B14 ....82.00
Farrell,Pa. S3 .....82.00
Lowellville,O. S3 ....82.00
Midland,Pa. C18 .....82.00
Munhall,Pa. U5 .....82.00
Sharon,Pa. S3 .....82.00

**BILLETS, BLOOMS & SLABS**
**Carbon, Rerolling (NT)**
Bartonville,Ill. K4 ...$82.00
Bessemer,Pa. U5 .....80.00
Buffalo R2 .....80.00
Clairton,Pa. U5 .....80.00
Ensley,Ala. T2 .....80.00
Fairfield,Ala. T2 .....80.00
Fontana,Calif. K1 ....90.50
Gary,Ind. U5 .....80.00
Johnstown,Pa. B2 ....80.00
Lackawanna,N.Y. B2..80.00
Munhall,Pa. U5 .....80.00
Owensboro,Ky. G8 ....80.00
S.Chicago,Ill. R2, U5 ..80.00
S.Duquesne,Pa. U5 ....80.00
Sterling,Ill. N15 .....80.00
Youngstown R2 .....80.00

**Carbon, Forging (NT)**
Bessemer,Pa. U5 ....$99.50
Buffalo R2 .....99.50
Canton,O. R2 .....102.00
Clairton,Pa. U5 .....99.50
Conshohocken,Pa. A3..104.50
Ensley,Ala. T2 .....99.50
Fairfield,Ala. T2 .....99.50
Farrell,Pa. S3 .....99.50
Fontana,Calif. K1 ....109.00
Gary,Ind. U5 .....99.50
Geneva,Utah C11 .....99.50
Houston S5 .....104.50
Johnstown,Pa. B2 .....99.50
Lackawanna,N.Y. B2..99.50
LosAngeles B3 .....109.00
Midland,Pa. C18 .....99.50
Munhall,Pa. U5 .....99.50
Owensboro,Ky. G8 ....99.50
Seattle B3 .....109.00
Sharon,Pa. S3 .....99.50
S.Chicago R2, U5, W14 99.50
S.Duquesne,Pa. U5 ....99.50
S.SanFrancisco B3 ...109.00
Warren,O. C17 .....99.50

**Alloy, Forging (NT)**
Bethlehem,Pa. B2 ..$119.00
Bridgeport,Conn. C32..119.00
Buffalo R2 .....119.00
Canton,O. R2, T7 ....119.00
Conshohocken,Pa. A3..126.00
Detroit S41 .....119.00
Economy,Pa. B14 ....119.00
Farrell,Pa. S3 .....119.00
Fontana,Calif. K1 ...140.00
Gary,Ind. U5 .....119.00
Houston S5 .....124.00
Ind.Harbor,Ind. Y1 ..119.00
Johnstown,Pa. B2 ....119.00
Lackawanna,N.Y. B2..119.00
LosAngeles B3 .....139.00
Lowellville,O. S3 ....119.00
Massillon,O. R2 .....119.00
Midland,Pa. C18 .....119.00
Munhall,Pa. U5 .....119.00
Owensboro,Ky. G8 ....119.00
Sharon,Pa. S3 .....119.00
S.Chicago R2,U5,W14 119.00
S.Duquesne,Pa. U5 ....119.00
Struthers,O. Y1 .....119.00
Warren,O. C17 .....119.00

**ROUNDS, SEAMLESS TUBE (NT)**
Buffalo R2 .....$122.50
Canton,O. R2 .....125.00
Cleveland R2 .....122.50
Gary,Ind. U5 .....122.50
S.Chicago,Ill. R2, W14 122.50
S.Duquesne,Pa. U5 ....122.50
Warren,O. C17 .....122.50

**SKELP**
Aliquippa,Pa. J5 .....5.05
Munhall,Pa. U5 .....5.05
Pittsburgh J5 .....5.05
Warren,O. R2 .....5.05
Youngstown R2, U5 ....5.05

**WIRE RODS**
AlabamaCity,Ala. R2 ..6.40
Aliquippa,Pa. J5 .....6.40
Alton,Ill. L1 .....6.60
Bartonville,Ill. K4 .....6.50
Buffalo W12 .....6.40
Cleveland A7 .....6.40
Donora,Pa. A7 .....6.40
Fairfield,Ala. T2 .....6.40
Houston S5 .....6.65
IndianaHarbor,Ind. Y1..6.40
Johnstown,Pa. B2 ....6.40
Joliet,Ill. A7 .....6.40
KansasCity,Mo. S5 ....6.65
Kokomo,Ind. C16 .....6.50
LosAngeles B3 .....7.20
Minnequa,Colo. C10 ....6.65
Monessen,Pa. P7 .....6.40
N.Tonawanda,N.Y. B11..6.40
Pittsburg,Calif. C11 ....7.20
Portsmouth,O. P12 ....6.40
Roebling,N.J. R5 .....6.50
S.Chicago,Ill. R2, W14 .6.40
SparrowsPoint,Md. B2 ..6.50
Sterling,Ill.(1) N15 ....6.40
Sterling,Ill. N15 .....6.50
Struthers,O. Y1 .....6.40
Worcester,Mass. A7 ....6.70

## STRUCTURALS

**Carbon Steel Std. Shapes**
AlabamaCity,Ala. R2 ..5.50
Aliquippa,Pa. J5 .....5.50
Atlanta A11 .....5.70
Bessemer,Ala. T2 .....5.50
Bethlehem,Pa. B2 .....5.55
Birmingham C15 .....5.50
Clairton,Pa. U5 .....5.50
Fairfield,Ala. T2 .....5.50
Fontana,Calif. K1 ....6.30
Gary,Ind. U5 .....5.50
Geneva,Utah C11 .....5.50
Houston S5 .....5.60
Ind.Harbor,Ind. I-2, Y1..5.50
Johnstown,Pa. B2 .....5.55
Joliet,Ill. P22 .....5.50
KansasCity,Mo. S5 ....5.60
Lackawanna,N.Y. B2 ..5.55
LosAngeles B3 .....6.20
Minnequa,Colo. C10 ....5.80
Munhall,Pa. U5 .....5.50
Niles,Calif. P1 .....6.25
Phoenixville,Pa. P4 ....5.55
Portland,Oreg. O4 .....6.25
Seattle B3 .....6.25
S.Chicago,Ill. U5, W14..5.50
S.SanFrancisco B3 ....6.15
Sterling,Ill. N15 .....5.50
Torrance,Calif. C11 ....6.20
Weirton,W.Va. W6 ....5.50

**Wide Flange**
Bethlehem,Pa. B2 .....5.55
Clairton,Pa. U5 .....5.50
Fontana,Calif. K1 ....6.45
IndianaHarbor,Ind. I-2..5.50
Lackawanna,N.Y. B2 ..5.55
Munhall,Pa. U5 .....5.50
Phoenixville,Pa. P4 ....5.55
S.Chicago,Ill. U5 .....5.50
Sterling,Ill. N15 .....5.50
Weirton,W.Va. W6 ....5.50

**Alloy Std. Shapes**
Aliquippa,Pa. J5 .....6.80
Clairton,Pa. U5 .....6.80
Gary,Ind. U5 .....6.80
Houston S5 .....6.90
Munhall,Pa. U5 .....6.80
S.Chicago,Ill. U5, W14..6.80

**H.S., L.A., Std. Shapes**
Aliquippa,Pa. J5 .....8.05
Bessemer,Ala. T2 .....8.05
Bethlehem,Pa. B2 .....8.10
Clairton,Pa. U5 .....8.05
Fairfield,Ala. T2 .....8.05
Fontana,Calif. K1 ....8.85
Gary,Ind. U5 .....8.05
Geneva,Utah C11 .....8.05
Houston S5 .....8.15
Ind.Harbor,Ind. I-2, Y1..8.05
Johnstown,Pa. B2 .....8.10
KansasCity,Mo. S5 ....8.15
Lackawanna,N.Y. B2 ..8.10
LosAngeles B3 .....8.75
Munhall,Pa. U5 .....8.05
Seattle B3 .....8.80
S.Chicago,Ill. U5, W14..8.05
S.SanFrancisco B3 ....8.70
Sterling,Ill. N15 .....7.75
Struthers,O. Y1 .....8.05

**H.S., L.A., Wide Flange**
Bethlehem,Pa. B2 .....8.10
Ind.Harbor,Ind. I-2 ....8.05
Lackawanna,N.Y. B2 ..8.10
Munhall,Pa. U5 .....8.05
S.Chicago,Ill. U5 .....8.05
Sterling,Ill. N15 .....7.75

## PILING

**BEARING PILES**
Bethlehem,Pa. B2 ....5.55
Ind.Harbor,Ind. I-2 ....5.50
Lackawanna,N.Y. B2 ..5.55
Munhall,Pa. U5 .....5.50
S.Chicago,Ill. I-2, U5 ..5.50

**STEEL SHEET PILING**
Ind.Harbor,Ind. I-2 ....6.50
Lackawanna,N.Y. B2 ..6.50
Munhall,Pa. U5 .....6.50
S.Chicago,Ill. I-2, U5 ..6.50
Weirton,W.Va. W6 ....6.50

## PLATES

**PLATES, Carbon Steel**
AlabamaCity,Ala. R2 ..5.30
Aliquippa,Pa. J5 .....5.30
Ashland,Ky.(15) A10 ...5.30
Atlanta A11 .....5.50
Bessemer,Ala. T2 .....5.30
Clairton,Pa. U5 .....5.30
Claymont,Del. C22 ....5.30
Cleveland J5, R2 .....5.30
Coatesville,Pa. L7 .....5.30
Conshohocken,Pa. A3 ..5.30
Ecorse,Mich. G5 .....5.30
Fairfield,Ala. T2 .....5.30
Farrell,Pa. S3 .....5.30
Fontana,Calif.(30)K1 ....6.10
Gary,Ind. U5 .....5.30
Geneva,Utah C11 .....5.30
GraniteCity,Ill. G4 ....5.40
Harrisburg,Pa. P4 .....5.30
Houston S5 .....5.40
Ind.Harbor,Ind. I-2, Y1..5.30
Johnstown,Pa. B2 .....5.30
Lackawanna,N.Y. B2 ..5.30
Mansfield,O. E6 .....5.30
Minnequa,Colo. C10 ....6.15
Munhall,Pa. U5 .....5.30
Newport,Ky. A2 .....5.30
Pittsburgh J5 .....5.30
Riverdale,Ill. A1 .....5.30
Seattle B3 .....6.20
Sharon,Pa. S3 .....5.30
S.Chicago,Ill. U5, W14..5.30
SparrowsPoint,Md. B2 ..5.30
Sterling,Ill. N15 .....5.30
Steubenville,O. W10 ....5.30
Warren,O. R2 .....5.30
Youngstown U5, Y1 ....5.30
Youngstown (27) R2 ..5.30

**PLATES, Carbon Abras. Resist.**
Claymont,Del. C22 ....7.05
Fontana,Calif. K1 ....7.85
Geneva,Utah C11 .....7.05
Houston S5 .....7.15
Johnstown,Pa. B2 .....7.05
SparrowsPoint,Md. B2 ..7.05

**PLATES, Wrought Iron**
Economy,Pa. B14 ....13.55

**PLATES, H.S., L.A.**
Aliquippa,Pa. J5 .....7.95
Ashland,Ky. A10 .....7.95
Bessemer,Ala. T2 .....7.95
Clairton,Pa. U5 .....7.95
Claymont,Del. C22 .....7.95
Cleveland J5, R2 .....7.95
Coatesville,Pa. L7 .....7.95
Conshohocken,Pa. A3 ..7.95
Economy,Pa. B14 .....7.95
Ecorse,Mich. G5 .....7.95
Fairfield,Ala. T2 .....7.95
Farrell,Pa. S3 .....7.95
Fontana,Calif.(30) K1 ..8.75
Gary,Ind. U5 .....7.95
Geneva,Utah C11 .....7.95
Houston S5 .....8.05
Ind.Harbor,Ind. I-2, Y1..7.95
Johnstown,Pa. B2 .....7.95
Munhall,Pa. U5 .....7.95
Pittsburgh J5 .....7.95
Seattle B3 .....8.85
Sharon,Pa. S3 .....7.95
S.Chicago,Ill. U5, W14..7.95
SparrowsPoint,Md. B2 ..7.95
Warren,O. R2 .....7.95
Youngstown U5, Y1 ....7.95

**PLATES, Alloy**
Aliquippa,Pa. J5 .....7.50
Claymont,Del. C22 .....7.50
Coatesville,Pa. L7 .....7.50
Economy,Pa. B14 .....7.50
Farrell,Pa. S3 .....7.50
Fontana,Calif. K1 ....8.30
Gary,Ind. U5 .....7.50
Houston S5 .....7.60
Ind.Harbor,Ind. Y1 ....7.50
Johnstown,Pa. B2 .....7.50
Lowellville,O. S3 .....7.50
Munhall,Pa. U5 .....7.50
Newport,Ky. A2 .....7.50
Pittsburgh J5 .....7.50
Seattle B3 .....8.40
Sharon,Pa. S3 .....7.50
S.Chicago,Ill. U5, W14..7.50
SparrowsPoint,Md. B2 ..7.50
Youngstown Y1 .....7.50

**FLOOR PLATES**
Cleveland J5 .....6.375
Conshohocken,Pa. A3 ..6.375
Ind.Harbor,Ind. I-2 ....6.375
Munhall,Pa. U5 .....6.375
Pittsburgh J5 .....6.375
S.Chicago,Ill. U5 .....6.375

**PLATES, Ingot Iron**
Ashland c.l.(15) A10 ..5.55
Ashland l.c.l.(15) A10 ..6.05
Cleveland c.l. R2 .....6.05
Warren,O. c.l. R2 .....6.05

## BARS

**BARS, Hot-Rolled Carbon (Merchant Quality)**
Ala.City,Ala.(9) R2 ..5.675
Aliquippa,Pa. (9) J5 ..5.675
Alton,Ill. L1 .....5.875
Atlanta(9) A11 .....5.875
Bessemer,Ala.(9) T2 ....5.675
Birmingham(9) C15 ..5.675
Buffalo(9) R2 .....5.675
Canton,O. (23) R2 .... 6.15
Clairton,Pa.(9) U5 ....5.675
Cleveland(9) R2 .....5.675
Ecorse,Mich.(9) G5 ....5.675
Emeryville,Calif. J7 ...6.425
Fairfield,Ala.(9) T2 ....5.675
Fairless,Pa.(9) U5 ....5.825
Fontana,Calif.(9) K1 ...6.375
Gary,Ind.(9) U5 .....5.675
Houston(9) S5 .....5.925
Ind.Harbor(9) I-2, Y1..5.675
Johnstown,Pa.(9) B2 ....5.675
Joliet,Ill. P22 .....5.675
KansasCity,Mo.(9) S5..5.925
Lackawanna(9) B2 ....5.675
LosAngeles(9) B3 ....6.375
Massillon,O. (23) R2 ..6.15
Midland,Pa.(23) C18 ..6.025
Milton,Pa. M18 .....5.825
Minnequa,Colo. C10 ...6.125
Niles,Calif. P1 .....6.375
N.Tonawanda,N.Y.(23)B11 6.025
Owensboro,Ky.(9) G8 ..6.025
Pittsburg,Calif.(9) C11 6.375
Pittsburgh(9) J5 ....5.675
Portland,Oreg. O4 ....6.425
Riverdale,Ill.(9) A1 ..5.675
Seattle A24, B3, N14 ..6.425
S.Ch'c'go(9)R2,U5,W14 5.675
S.Duquesne,Pa.(9) U5..5.675
S.SanFran.,Calif.(9)B3 6.425
Sterling,Ill.(1)(9) N15..5.675
Sterling,Ill.(9) N15 ..5.775
Struthers,O.(9) Y1 ....5.675
Tonawanda,N.Y. B12 ..5.675
Torrance,Calif.(9) C11 6.375
Warren,O. C17 .....6.025
Youngstown(9) R2, U5..5.675

**BARS, Hot-Rolled Alloy**
Aliquippa,Pa. J5 ....6.725
Bethlehem,Pa. B2 .....6.725
Bridgeport,Conn. C32 ..6.80
Buffalo R2 .....6.725
Canton,O. R2, T7 ....6.725
Clairton,Pa. U5 .....6.725
Detroit S41 .....6.725
Economy,Pa. B14 .....6.725
Ecorse,Mich. G5 .....6.725
Fairless,Pa. U5 .....6.875
Farrell,Pa. S3 .....6.725
Fontana,Calif. K1 ....7.775
Gary,Ind. U5 .....6.725
Houston S5 .....6.975
Ind.Harbor,Ind. I-2, Y1..6.725
Johnstown,Pa. B2 .....6.725
KansasCity,Mo. S5 ....6.975
Lackawanna,N.Y. B2 ..6.725
LosAngeles B3 .....7.775
Lowellville,O. S3 .....6.725
Massillon,O. R2 .....6.725
Midland,Pa. C18 .....6.725
Owensboro,Ky. G8 .....6.725
Pittsburgh J5 .....6.725
Sharon,Pa. S3 .....6.725
S.Chicago R2, U5, W14 6.725
S.Duquesne,Pa. U5 ....6.725
Struthers,O. Y1 .....6.725
Warren,O. C17 .....6.725
Youngstown U5 .....6.725

**BARS & SMALL SHAPES, H.R. High-Strength, Low-Alloy**
Aliquippa,Pa. J5 .....8.30
Bessemer,Ala. T2 .....8.30
Bethlehem,Pa. B2 .....8.30
Clairton,Pa. U5 .....8.30
Cleveland R2 .....8.30
Ecorse,Mich. G5 .....8.30
Fairfield,Ala. T2 .....8.30
Fontana,Calif. K1 ....9.00
Gary,Ind. U5 .....8.30
Houston S5 .....8.55
Ind.Harbor,Ind. Y1 ....8.30
Johnstown,Pa. B2 .....8.30
KansasCity,Mo. S5 ....8.55
Lackawanna,N.Y. B2 ..8.30
LosAngeles B3 .....9.00
Pittsburgh J5 .....8.30
Seattle B3 .....9.05
S.Chicago,Ill. R2, W14..8.30
S.Duquesne,Pa. U5 ....8.30
S.SanFrancisco B3 ....9.05
Struthers,O. Y1 .....8.30
Youngstown U5 .....8.30

**BAR SIZE ANGLES; H.R. Carbon**
Bethlehem,Pa.(9) B2 ..5.825
Houston(9) S5 .....5.925
KansasCity,Mo.(9)S5 ..5.925
Lackawanna(9) B2 ....5.675
Sterling,Ill. N15 .....5.775
Sterling,Ill.(1) N15 ..5.675
Tonawanda,N.Y. B12 ..5.675

**BAR SIZE ANGLES; S. Shapes**
Aliquippa,Pa. J5 .....5.675
Atlanta A11 .....5.875
Joliet,Ill. P22 .....5.675
Minnequa,Colo. C10 ...6.125
Niles,Calif. P1 .....6.375
Pittsburgh J5 .....5.675
Portland,Oreg. O4 .....6.425
SanFrancisco S7 .....6.52
Seattle B3 .....6.425

**BAR SHAPES, Hot-Rolled Alloy**
Aliquippa,Pa. J5 .....6.80
Clairton,Pa. U5 .....6.80
Gary,Ind. U5 .....6.80
Houston S5 .....7.05
KansasCity,Mo. S5 ....7.05
Pittsburgh J5 .....6.80
Youngstown U5 .....6.80

**BARS, C.F. Leaded (Including leaded extra)**
**Carbon**
LosAngeles P2, S30 ..11.75*

**Alloy**
Ambridge,Pa. W18 ..10.175
BeaverFalls,Pa. M12..10.175
Camden,N.J. P13 .....10.35
Chicago W18 .....10.175
Elyria,O. W8 .....10.175
Monaca,Pa. S17 .....10.175
Newark,N.J. W18 .....10.35
SpringCity,Pa. K3 .....10.35

*Grade A; add 0.05c for Grade B.

**BARS, Cold-Finished Carbon**
Ambridge,Pa. W18 ....7.65
BeaverFalls,Pa. M12,R2..7.65
Birmingham C15 .....8.25
Buffalo B5 .....7.70
Camden,N.J. P13 .....8.10
Carnegie,Pa. C12 .....7.65
Chicago W18 .....7.65
Cleveland A7, C20 ....7.65
Detroit B5, P17 .....7.85
Detroit S41 .....7.65
Donora,Pa. A7 .....7.65
Elyria,O. W8 .....7.65
FranklinPark,Ill. N5 ....7.65
Gary,Ind. R2 .....7.65
Green Bay,Wis. F7 .....7.65
Hammond,Ind. J5, L2 ..7.65
Hartford,Conn. R2 ....8.15
Harvey,Ill. B5 .....7.65
LosAngeles(49) S30 ....9.10
LosAngeles(49) P2, R2..9.10
Mansfield,Mass. B5 ....8.10
Massillon,O. R2, R8 ....7.65
Midland,Pa. C18 .....7.65
Monaca,Pa. S17 .....7.65
Newark,N.J. W18 .....8.10
NewCastle,Pa.(17) B4 ..7.65
Pittsburgh J5 .....7.65
Plymouth,Mich. P5 ....7.90
Putnam,Conn. W18 ....8.20
Readville,Mass. C14 ....8.20
S.Chicago,Ill. W14 ....7.65
SpringCity,Pa. K3 .....8.10
Struthers,O. Y1 .....7.65
Warren,O. C17 .....7.65
Waukegan,Ill. A7 .....7.65
Willimantic,Conn. J5....8.15
Youngstown F3, Y1 ....7.65

**BARS, Cold-Finished Carbon (Turned and Ground)**
Cumberland,Md.(5) C19 6.55

**BARS, Cold-Finished Alloy**
Ambridge,Pa. W18 ....9.025
BeaverFalls,Pa. M12,R2 9.025
Bethlehem,Pa. B2 .....9.025
Bridgeport,Conn. C32..9.175
Buffalo B5 .....9.025
Camden,N.J. P13 .....9.20
Canton,O. T7 .....9.025
Carnegie,Pa. C12 .....9.025
Chicago W18 .....9.025
Cleveland A7, C20 ....9.025
Detroit B5, P17 .....9.225
Detroit S41 .....9.025
Donora,Pa. A7 .....9.025
Elyria,O. W8 .....9.025
FranklinPark,Ill. N5 ....9.025
Gary,Ind. R2 .....9.025
GreenBay,Wis. F7 .....9.025
Hammond,Ind. J5, L2 ..9.025
Hartford,Conn. R2 .....9.325
Harvey,Ill. B5 .....9.025
Lackawanna,N.Y. B2..9.025
LosAngeles P2, S30 ...11.00
Mansfield,Mass. B5 ....9.325
Massillon,O. R2, R8 ....9.025
Midland,Pa. C18 .....9.025
Monaca,Pa. S17 .....9.025
Newark,N.J. W18 .....9.20
Plymouth,Mich. P5 ....9.225
S.Chicago,Ill. W14 ....9.025
SpringCity,Pa. K3 .....9.20
Struthers,O. Y1 .....9.025
Warren,O. C17 .....9.025
Waukegan,Ill. A7 .....9.025
Willimantic,Conn. J5 ..9.325
Worcester,Mass. A7 ....9.325
Youngstown F3, Y1 ....9.025

**BARS, Reinforcing, Billet (To Fabricators)**

AlabamaCity,Ala. R2 ..5.675
Atlanta A11 .....5.675
Birmingham C15 .....5.675
Buffalo R2 .....5.675
Cleveland R2 .....5.675
Ecorse, Mich. G5 .....5.675
Emeryville,Calif. J7 ..6.425
Fairfield,Ala. T2 .....5.675
Fairless,Pa. U5 .....5.825
Fontana,Calif. K1 ....6.375
Ft.Worth,Tex(4)(26)T4 5.925
Gary,Ind. U5 .....5.675
Houston S5 .....5.925
Ind.Harbor,Ind. I-2, Y1 5.675
Johnstown,Pa. B2 ....5.675
Joliet,Ill. P22 .....5.675
KansasCity,Mo. S5 ....5.925
Kokomo,Ind. C16 .....5.775
Lackawanna,N.Y. B2 ..5.675
LosAngeles B3 .....6.375
Madison,Ill. L1 .....5.875
Milton,Pa. M18 .....5.825
Minnequa,Colo. C10 ..6.125
Niles,Calif. P1 .....6.375
Pittsburg,Calif. C11 ..6.375
Pittsburgh J5 .....5.675
Portland,Oreg. O4 ....6.425
SandSprings,Okla. S5 ..5.925
Seattle A24, B3, N14 ..6.425
S.Chicago,Ill. R2, W14 5.675
S.Duquesne,Pa. U5 ...5.675
S.SanFrancisco B3 ...6.425
SparrowsPoint,Md. B2 ..5.675
Sterling,Ill.(1) N15 ...5.675
Sterling,Ill. N15 .....5.775
Struthers,O. Y1 .....5.675
Tonawanda,N.Y. B12 ..6.10
Torrance,Calif. C11 ..6.375
Youngstown R2, U5 ..5.675

**BARS, Reinforcing, Billet (Fabricated; To Consumers)**

Baltimore B2 .....7.42
Boston B2, U8 .....8.15
Chicago U8 .....7.41
Cleveland U8 .....7.39
Houston S5 .....7.60
Johnstown,Pa. B2 .....7.33
KansasCity,Mo. S5 ....7.60
Lackawanna,N.Y. B2 ..7.35
Marion,O. P11 .....6.70
Newark,N.J. U8 .....7.80
Philadelphia U8 .....7.63
Pittsburgh J5, U8 ...7.35
SandSprings,Okla. S5 ..7.60
Seattle A24, B3, N14 ..7.95
SparrowsPt.,Md. B2 ..7.33
St.Paul U8 .....8.17
Williamsport,Pa. S19 ..7.25

**BARS, Wrought Iron**

Economy,Pa.(S.R.)B14 14.90
Economy,Pa.(D.R.)B14 18.55
Economy(Staybolt) B14 19.00
McK.Rks.(S.R.) L5 ..14.50
McK.Rks.(D.R.) L5 ..19.80
McK.Rks.(Staybolt)L5 20.95

**BARS, Rail Steel**

ChicagoHts.(3) C2, I-2 5.575
ChicagoHts.(4) (44) I-2 5.675
ChicagoHts.(4) C2 ...5.675
Franklin,Pa. (3) F5 ..5.575
Franklin,Pa. (4) F5 ..5.675
JerseyShore,Pa.(3) J8 ..5.55
Marion,O.(3) P11 ....5.575
Tonawanda(3) B12 ...5.575
Tonawanda(4) B12 ...6.10

## SHEETS

**SHEETS, Hot-Rolled Steel (18 Gage and Heavier)**

AlabamaCity,Ala. R2 ..5.10
Allenport,Pa. P7 .....5.10
Aliquippa,Pa. J5 .....5.10
Ashland,Ky.(8) A10 ...5.10
Cleveland J5, R2 .....5.10
Conshohocken,Pa. A3 ..5.15
Detroit(8) M1 .....5.10
Ecorse,Mich. G5 .....5.10
Fairfield,Ala. T2 .....5.10
Fairless,Pa. U5 .....5.15
Farrell,Pa. S3 .....5.10
Fontana,Calif. K1 ....5.825
Gary,Ind. U5 .....5.10
Geneva,Utah C11 .....5.20
GraniteCity,Ill.(8) G4 ..5.20
Ind.Harbor,Ind. I-2, Y1 5.10
Irvin,Pa. U5 .....5.10
Lackawanna,N.Y. B2 ..5.10
Mansfield,O. E6 .....5.10
Munhall,Pa. U5 .....5.10
Newport,Ky. A2 .....5.10
Niles,O. M21, S3 .....5.10
Pittsburg,Calif. C11 ....5.80
Pittsburgh J5 .....5.10
Portsmouth,O. P12 ....5.10
Riverdale,Ill. A1 .....5.10
Sharon,Pa. S3 .....5.10
S.Chicago,Ill. U5, W14 ..5.10
SparrowsPoint,Md. B2 ..5.10
Steubenville,O. W10 ....5.10
Warren,O. R2 .....5.10
Weirton,W.Va. W6 ....5.10
Youngstown U5, Y1 ....5.10

**SHEETS, H.R. (19 Ga. & Lighter)**

Niles,O. M21, S3 ....6.275

**SHEETS, H.R., Alloy**

Gary,Ind. U5 .....8.40
Ind.Harbor,Ind. Y1 ....8.40
Irvin,Pa. U5 .....8.40
Munhall,Pa. U5 .....8.40
Newport,Ky. A2 .....8.40
Youngstown U5, Y1 ....8.40

**SHEETS, H.R. (14 Ga. & Heavier) High-Strength, Low-Alloy**

Aliquippa,Pa. J5 .....7.525
Ashland,Ky. A10 .....7.525
Cleveland J5, R2 .....7.525
Conshohocken,Pa. A3 ..7.575
Ecorse,Mich. G5 .....7.525
Fairfield,Ala. T2 .....7.525
Fairless,Pa. U5 .....7.575
Farrell,Pa. S3 .....7.525
Fontana,Calif. K1 .....8.25
Gary,Ind. U5 .....7.525
Ind.Harbor,Ind. I-2 Y1 7.525
Irvin,Pa. U5 .....7.525
Lackawanna(35) B2 ..7.525
Munhall,Pa. U5 .....7.525
Niles,O. S3 .....7.525
Pittsburgh J5 .....7.525
S.Chicago,Ill. U5, W14 7.525
Sharon,Pa. S3 .....7.525
SparrowsPoint(36) B2..7.525
Warren,O. R2 .....7.525
Weirton,W.Va. W6 ....7.525
Youngstown U5, Y1 ..7.525

**SHEETS, Hot-Rolled Ingot Iron (18 Gage and Heavier)**

Ashland,Ky.(8) A10 ...5.35
Cleveland R2 .....5.875
Warren,O. R2 .....5.875

**SHEETS, Cold-Rolled Ingot Iron**

Cleveland R2 .....7.05
Middletown,O. A10 ....6.775
Warren,O. R2 .....7.05

**SHEETS, Cold-Rolled Steel (Commercial Quality)**

AlabamaCity,Ala. R2 .6.275
Allenport,Pa. P7 .....6.275
Aliquippa,Pa. J5 .....6.275
Cleveland J5, R2 .....6.275
Conshohocken,Pa. A3..6.325
Detroit M1 .....6.275
Ecorse,Mich. G5 .....6.275
Fairfield,Ala. T2 .....6.275
Fairless,Pa. U5 .....6.325
Follansbee,W.Va. F4 ..6.275
Fontana,Calif. K1 .....7.40
Gary,Ind. U5 .....6.275
GraniteCity,Ill. G4 ....6.375
Ind.Harbor,Ind. I-2, Y1 6.275
Irvin,Pa. U5 .....6.275
Lackawanna,N.Y. B2..6.275
Mansfield,O. E6 .....6.275
Middletown,O. A10 ....6.275
Newport,Ky. A2 .....6.275
Pittsburg,Calif. C11 ..7.225
Pittsburgh J5 .....6.275
Portsmouth,O. P12 ....6.275
SparrowsPoint,Md. B2.6.275
Steubenville,O. W10 ..6.275
Warren,O. R2 .....6.275
Weirton,W.Va. W6 ....6.275
Yorkville,O. W10 ....6.275
Youngstown Y1 .....6.275

**SHEETS, Cold-Rolled, High-Strength, Low-Alloy**

Aliquippa,Pa. J5 .....9.275
Cleveland J5, R2 .....9.275
Ecorse,Mich. G5 .....9.275
Fairless,Pa. U5 .....9.325
Fontana,Calif. K1 ....10.40
Gary,Ind. U5 .....9.275
Ind.Harbor,Ind. I-2, Y1 9.275
Lackawanna(37) B2 ..9.275
Pittsburgh J5 .....9.275
SparrowsPoint(38) B2..9.275
Warren,O. R2 .....9.275
Weirton,W.Va. W6 ....9.275
Youngstown Y1 .....9.275

**SHEETS, Culvert**

| | Cu Steel | Cu Fe |
|---|---|---|
| Ala.City,Ala. R2 | 7.225 | .... |
| Ashland,Ky. A10 | 7.225 | 7.475 |
| Canton,O. R2 | 7.225 | 7.75 |
| Fairfield T2 | 7.225 | 7.475 |
| Gary,Ind. U5 | 7.225 | 7.475 |
| GraniteCity,Ill.G4 | 7.325 | .... |
| Ind.Harbor I-2 | 7.225 | 7.475 |
| Irvin,Pa. U5 | 7.225 | 7.475 |
| Kokomo,Ind. C16 | 7.325 | .... |
| MartinsFry. W10 | 7.225 | 7.475 |
| Pitts.,Calif. C11 | 7.975 | .... |
| Pittsburgh J5 | 7.225 | .... |
| SparrowsPt. B2 | 7.225 | .... |

**SHEETS, Culvert—Pure Iron**

Ind.Harbor,Ind. I-2 ...7.475

**SHEETS, Galvanized Steel Hot-Dipped**

AlabamaCity,Ala. R2 .6.875‡
Ashland,Ky. A10 ...6.875†
Canton,O. R2 .....6.875‡
Dover,O. E6 .....6.875†
Fairfield,Ala. T2 .....6.875†
Gary,Ind. U5 .....6.875†
GraniteCity,Ill. G4 ...6.975*
Ind.Harbor,Ind. I-2 ...6.875†
Irvin,Pa. U5 .....6.875†
Kokomo,Ind. C16 ....6.975‡
MartinsFerry,O. W10 .6.875*
Middletown,O. A10 ....6.875†
Pittsburg,Calif. C11 ...7.625*
Pittsburgh J5 .....6.875†
SparrowsPt.,Md. B2 ..6.875†
Warren,O. R2 .....6.875‡
Weirton,W.Va. W6 ....6.875*

*Continuous and noncontinuous. †Continuous. ‡Noncontinuous.

**SHEETS, Well Casing**

Fontana,Calif. K1 ....7.325

**SHEETS, Galvanized High-Strength, Low-Alloy**

Irvin,Pa. U5 .....10.125
Pittsburgh J5 .....10.125
SparrowsPt.(39) B2 ..10.025

**SHEETS, Galvannealed Steel**

Canton,O. R2 .....7.275
Irvin,Pa. U5 .....7.275

**SHEETS, Galvanized Ingot Iron (Hot-Dipped Continuous)**

Ashland,Ky. A10 .....7.125
Middletown,O. A10 ....7.125

**SHEETS, Electrogalvanized**

Cleveland(28) B2 .....7.65
Niles,O.(28) R2 .....7.65
Weirton,W.Va. W6 .....7.50
Youngstown J5 .....7.50

**SHEETS, Aluminum Coated**

Butler,Pa. A10 (type 1) 9.525
Butler,Pa. A10 (type 2) 9.625

**SHEETS, Enameling Iron**

Ashland,Ky. A10 .....6.775
Cleveland R2 .....6.775
Fairfield,Ala. T2 .....6.775
Gary,Ind. U5 .....6.775
GraniteCity,Ill. G4 ....6.875
Ind.Harbor,Ind. I-2, Y1 6.775
Irvin,Pa. U5 .....6.775
Middletown,O. A10 ....6.775
Niles,O. M21, S3 .....6.775
Youngstown Y1 .....6.775

**BLUED STOCK, 29 Gage**

Dover,O. E6 .....8.70
Follansbee,W.Va. F4 ....8.70
Ind.Harbor, Ind. I-2 ....8.70
Mansfield,O. E6 .....8.70
Warren,O. R2 .....8.70
Yorkville,O. W10 .....8.70

**SHEETS, Long Terne, Steel (Commercial Quality)**

BeechBottom,W.Va.W10 7.225
Gary,Ind. U5 .....7.225
Mansfield,O. E6 .....7.225
Middletown,O. A10 ....7.225
Niles,O. M21, S3 .....7.225
Warren,O. R2 .....7.225
Weirton,W.Va. W6 ....7.225

**SHEETS, Long Terne, Ingot Iron**

Middletown,O. A10 ....7.625

## Key To Producers

A1 Acme Steel Co.
A2 Acme-Newport Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A5 Alloy Metal Wire Div., H. K. Porter Co. Inc.
A6 American Shim Steel Co.
A7 American Steel & Wire Div., U. S. Steel Corp.
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.
A24 Alaska Steel Mills Inc.

B1 Babcock & Wilcox Co.
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B8 Braeburn Alloy Steel
B9 Brainard Steel Div., Sharon Steel Corp.
B10 E. & G. Brooke, Wickwire Spencer Steel Div., Colo. Fuel & Iron
B11 Buffalo Bolt Co., Div., Buffalo Eclipse Corp.
B12 Buffalo Steel Corp.
B14 A. M. Byers Co.
B15 J. Bishop & Co.

C1 Calstrip Steel Corp.
C2 Calumet Steel Div., Borg-Warner Corp.
C4 Carpenter Steel Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia-Geneva Steel Div., U. S. Steel Corp.
C12 Columbia Steel & Shaft.
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft.
C15 Connors Steel Div., H. K. Porter Co. Inc.
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Plant, Wickwire Spencer Steel Div., Colo. Fuel & Iron
C23 Charter Wire Inc.
C24 G. O. Carlson Inc.
C32 Carpenter Steel of N.Eng.

D2 Detroit Steel Corp.
D4 Disston Div., H.K. Porter Co. Inc.
D6 Driver-Harris Co.
D7 Dickson Weatherproof Nail Co.
D8 Damascus Tube Co.
D9 Wilbur B. Driver Co.

E1 Eastern Gas&Fuel Assoc.
E2 Eastern Stainless Steel
E5 Elliott Bros. Steel Co.
E6 Empire-Reeves Steel Corp.
E10 Enamel Prod. & Plating

F2 Firth Sterling Inc.
F3 Fitzsimmons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div., Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wire
F8 Ft. Wayne Metals Inc.

G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.
G8 Green River Steel Corp.

H1 Hanna Furnace Corp.
H7 Helical Tube Co.

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.
I-6 Ivins Steel Tube Works
I-7 Indiana Steel & Wire Co.

J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.

K1 Kaiser Steel Corp.
K2 Keokuk Electro-Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
K7 Kenmore Metals Corp.

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Steel Co.
L6 Lone Star Steel Co.
L7 Lukens Steel Co.
L8 Leschen Wire Rope Div., H. K. Porter Co. Inc.

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M6 Mercer Pipe Div., Sawhill Tubular Products
M8 Mid-States Steel & Wire
M12 Moltrup Steel Products
M14 McInnes Steel Co.
M16 Md. Fine & Specialty Wire Co. Inc.
M17 Metal Forming Corp.
M18 Milton Steel Div., Merritt-Chapman&Scott
M21 Mallory-Sharon Metals Corp.
M22 Mill Strip Products Co.

N1 National-Standard Co.
N2 National Supply Co.
N3 National Tube Div., U. S. Steel Corp.
N5 Nelsen Steel & Wire Co.
N6 New England High Carbon Wire Co.
N8 Newman-Crosby Steel
N14 Northwest. Steel Rolling Mills Inc.
N15 Northwestern S.&W. Co.
N20 Neville Ferro Alloy Co.

O4 Oregon Steel Mills

P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Steel Corp.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke&Chem.
P7 Pittsburgh Steel Co.
P11 Pollak Steel Co.
P12 Portsmouth Div., Detroit Steel Corp.
P13 Precision Drawn Steel
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., American Chain & Cable
P17 Plymouth Steel Corp.
P19 Pitts. Rolling Mills
P20 Prod. Steel Strip Corp.
P22 Phoenix Mfg. Co.
P24 Phil. Steel & Wire Corp.

R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R8 Reliance Div. Eaton Mfg.
R9 Rome Mfg. Co.
R10 Rodney Metals Inc.

S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S4 Sharon Tube Co.
S5 Sheffield Div., Armco Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S12 Spencer Wire Corp.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S17 Superior Drawn Steel Co.
S18 Superior Steel Div., Copperweld Steel Co.
S19 Sweet's Steel Co.
S20 Southern States Steel
S23 Superior Tube Co.
S25 Stainless Welded Prod.
S26 Specialty Wire Co. Inc.
S30 Sierra Drawn Steel Corp.
S40 Seneca Steel Service
S41 Stainless & Strip Div., J&L Steel Corp.
S42 Southern Elec. Steel Co.
S43 Seymour Mfg. Co.
S44 Screw & Bolt Corp. of America
T2 Tenn. Coal & Iron Div., U. S. Steel Corp.
T3 Tenn. Products & Chemical Corp.
T4 Texas Steel Co.
T5 Thomas Strip Div., Pittsburgh Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div., Am. Rad. & Stan. San.
T13 Tube Methods Inc.
T19 Techalloy Co. Inc.

U3 Union Wire Rope Corp.
U4 Universal-Cyclops Steel
U5 United States Steel Corp.
U6 U. S. Pipe & Foundry
U7 Ulbrich Stainless Steels
U8 U. S. Steel Supply Div., U. S. Steel Corp.
U11 Union Carbide Metals Co.
U13 Union Steel Corp.

V2 Vanadium-Alloys Steel
V3 Vulcan-Kidd Steel Div., H. K. Porter Co.

W1 Wallace Barnes Steel Div., Associated Spring Corp.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W8 Western Automatic Machine Screw Co.
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div., International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.

Y1 Youngstown Sheet & Tube

## STRIP

**STRIP, Hot-Rolled Carbon**

| | |
|---|---|
| Ala.City,Ala.(27) R2 | 5.10 |
| Allenport,Pa. P7 | 5.10 |
| Alton,Ill. L1 | 5.30 |
| Ashland,Ky.(8) A10 | 5.10 |
| Atlanta A11 | 5.10 |
| Bessemer,Ala. T2 | 5.10 |
| Birmingham C15 | 5.10 |
| Buffalo(27) R2 | 5.10 |
| Conshohocken,Pa. A3 | 5.15 |
| Detroit M1 | 5.10 |
| Ecorse,Mich. G5 | 5.10 |
| Fairfield,Ala. T2 | 5.10 |
| Farrell,Pa. S3 | 5.10 |
| Fontana,Calif. K1 | 5.825 |
| Gary,Ind. U5 | 5.10 |
| Ind.Harbor,Ind. I-2, Y1 | 5.10 |
| Johnstown,Pa.(25) B2 | 5.10 |
| Lackaw'na,N.Y.(25) B2 | 5.10 |
| LosAngeles(25) B3 | 5.85 |
| LosAngeles C1 | 8.60 |
| Minnequa,Colo. C10 | 6.20 |
| Riverdale,Ill. A1 | 5.10 |
| SanFrancisco S7 | 6.60 |
| Seattle(25) B3 | 6.10 |
| Seattle N14 | 6.60 |
| Sharon,Pa. S3 | 5.10 |
| S.Chicago,Ill. W14 | 5.10 |
| S.SanFrancisco(25) B3 | 5.85 |
| SparrowsPoint,Md. B2 | 5.10 |
| Torrance,Calif. C11 | 5.85 |
| Warren,O. R2 | 5.10 |
| Weirton,W.Va. W6 | 5.10 |
| Youngstown U5 | 5.10 |

**STRIP, Hot-Rolled Alloy**

| | |
|---|---|
| Carnegie,Pa. S18 | 8.40 |
| Farrell,Pa. S3 | 8.40 |
| Gary,Ind. U5 | 8.40 |
| Houston S5 | 8.65 |
| Ind. Harbor,Ind. Y1 | 8.40 |
| KansasCity,Mo. S5 | 8.65 |
| LosAngeles B3 | 9.60 |
| Lowellville,O. S3 | 8.40 |
| Newport,Ky. A2 | 8.40 |
| Sharon,Pa. A2, S3 | 8.40 |
| S.Chicago,Ill. W14 | 8.40 |
| Youngstown U5, Y1 | 8.40 |

**STRIP, Hot-Rolled**
**High-Strength, Low-Alloy**

| | |
|---|---|
| Ashland,Ky. A10 | 7.575 |
| Bessemer,Ala. T2 | 7.575 |
| Conshohocken,Pa. A3 | 7.575 |
| Ecorse,Mich. G5 | 7.575 |
| Fairfield,Ala. T2 | 7.575 |
| Farrell,Pa. S3 | 7.575 |
| Gary,Ind. U5 | 7.575 |
| Ind.Harbor,Ind. I-2, Y1 | 7.575 |
| Lackawanna,N.Y. B2 | 7.575 |
| LosAngeles(25) B3 | 8.325 |
| Seattle(25) B3 | 8.575 |
| Sharon,Pa. S3 | 7.575 |
| S.Chicago,Ill. W14 | 7.575 |
| S.SanFrancisco(25) B3 | 8.325 |
| SparrowsPoint,Md. B2 | 7.575 |
| Warren,O. R2 | 7.575 |
| Weirton,W.Va. W6 | 7.575 |
| Youngstown U5, Y1 | 7.575 |

**STRIP, Hot-Rolled Ingot Iron**

| | |
|---|---|
| Ashland,Ky.(8) A10 | 5.35 |
| Warren,O. R2 | 5.875 |

**STRIP, Cold-Rolled Carbon**

| | |
|---|---|
| Anderson,Ind. G6 | 7.425 |
| Baltimore T6 | 7.425 |
| Boston T6 | 7.975 |
| Buffalo S40 | 7.425 |
| Cleveland A7, J5 | 7.425 |
| Dearborn,Mich. S3 | 7.425 |
| Detroit D2, M1, P20 | 7.425 |
| Dover,O. G6 | 7.425 |
| Evanston,Ill. M22 | 7.525 |
| Farrell,Pa. S3 | 7.425 |
| Follansbee,W.Va. F4 | 7.425 |
| Fontana,Calif. K1 | 9.20 |
| FranklinPark,Ill. T6 | 7.525 |
| Ind.Harbor,Ind. Y1 | 7.425 |
| Indianapolis S41 | 7.575 |
| Los Angeles C1, S41 | 9.30 |
| McKeesport,Pa. E10 | 7.525 |
| NewBedford,Mass. R10 | 7.875 |
| NewBritain,Conn. S15 | 7.875 |
| NewCastle,Pa. B4, E5 | 7.425 |
| NewHaven,Conn. D2 | 7.875 |
| NewKensington,Pa. A6 | 7.425 |
| Pawtucket,R.I. R3 | 7.975 |
| Pawtucket,R.I. N8 | 7.975 |
| Philadelphia P24 | 7.875 |
| Pittsburgh J5 | 7.425 |
| Riverdale,Ill. A1 | 7.525 |
| Rome,N.Y.(32) R6 | 7.425 |
| Sharon,Pa. S3 | 7.425 |
| Trenton,N.J.(31) R5 | 8.875 |
| Wallingford,Conn. W2 | 7.875 |
| Warren,O. R2, T5 | 7.425 |
| Worcester,Mass. A7 | 7.975 |
| NewBritain,Conn. S5 | 7.875 |

**Strip, Cold-Rolled Alloy**

| | |
|---|---|
| Boston T6 | 15.90 |
| Carnegie,Pa. S18 | 15.55 |
| Cleveland A7 | 15.55 |
| Dover,O. G6 | 15.55 |
| Farrell,Pa. S3 | 15.55 |
| FranklinPark,Ill. T6 | 15.55 |
| Harrison,N.J. C18 | 15.55 |
| Indianapolis S41 | 15.70 |
| LosAngeles S41 | 17.75 |
| Lowellville,O. S3 | 15.55 |
| Pawtucket,R.I. N8 | 15.90 |
| Rivedale,Ill. A1 | 15.55 |
| Sharon,Pa. S3 | 15.55 |
| Worcester,Mass. A7 | 15.85 |
| Youngstown S41 | 15.55 |

**STRIP, Cold-Rolled**
**High-Strength, Low-Alloy**

| | |
|---|---|
| Cleveland A7 | 10.80 |
| Dearborn,Mich. S3 | 10.80 |
| Dover,O. G6 | 10.80 |
| Farrell,Pa. S3 | 10.80 |
| Ind.Harbor,Ind. Y1 | 10.80 |
| Sharon,Pa. S3 | 10.80 |
| Warren,O. R2 | 10.80 |

| STRIP, Cold-Finished Spring Steel (Annealed) | 0.26-0.40C | 0.41-0.60C | 0.61-0.80C | 0.81-1.05C | 1.06-1.35C |
|---|---|---|---|---|---|
| Baltimore T6 | 9.50 | 10.70 | 12.90 | 15.90 | 18.85 |
| Boston T6 | 9.50 | 10.70 | 12.90 | 15.90 | 18.85 |
| Bristol,Conn. W1 | ... | 10.70 | 12.90 | 16.10 | 19.30 |
| Carnegie,Pa. S18 | 8.95 | 10.40 | 12.60 | 15.60 | .... |
| Cleveland A7 | 8.95 | 10.40 | 12.60 | 15.60 | 18.55 |
| Dearborn,Mich. S3 | 9.05 | 10.50 | 12.70 | .... | .... |
| Detroit D2 | 9.05 | 10.50 | 12.70 | 15.70 | .... |
| Dover,O. G6 | 8.95 | 10.40 | 12.60 | 15.60 | 18.55 |
| Evanston,Ill. M22 | 8.95 | 10.40 | 12.60 | 15.60 | .... |
| Farrell,Pa. S3 | 8.95 | 10.40 | 12.60 | 15.60 | 18.55 |
| Fostoria,O. S1 | 10.05 | 10.40 | 12.60 | 15.60 | .... |
| FranklinPark,Ill. T6 | 9.05 | 10.40 | 12.60 | 15.60 | 18.55 |
| Harrison,N.J. C18 | ... | .... | 12.90 | 16.10 | 19.30 |
| Indianapolis S41 | 9.10 | 10.55 | 12.60 | 15.60 | 18.55 |
| LosAngeles C1 | 11.15 | 12.60 | 14.80 | 17.80 | .... |
| LosAngeles S41 | 11.15 | 12.60 | 14.80 | .... | .... |
| NewBritain,Conn. S15 | 9.40 | 10.70 | 12.90 | 15.90 | 18.85 |
| NewCastle,Pa. B4, E5 | 8.95 | 10.40 | 12.60 | 15.60 | .... |
| NewHaven,Conn. D2 | 9.40 | 10.70 | 12.90 | 15.90 | .... |
| NewKensington,Pa. A6 | 9.85 | 10.40 | 12.60 | 15.60 | .... |
| NewYork W3 | ... | 10.70 | 12.90 | 16.10 | 19.30 |
| Pawtucket,R.I. N8 | 9.50 | 10.70 | 12.90 | 15.90 | 18.85 |
| Riverdale,Ill. A1 | 9.05 | 10.40 | 12.60 | 15.60 | 18.55 |
| Rome,N.Y.(32) R6 | 8.95 | 10.40 | 12.60 | 15.60 | 18.55 |
| Sharon,Pa. S3 | 8.95 | 10.40 | 12.60 | 15.60 | 18.55 |
| Trenton,N.J. R5 | ... | 10.70 | 12.90 | 15.90 | 18.85 |
| Wallingford,Conn. W2 | 9.40 | 10.70 | 12.90 | 15.90 | 18.75 |
| Warren,O. T5 | 8.95 | 10.40 | 12.60 | 15.60 | 18.55 |
| Worcester Mass. A7, T6 | 9.50 | 10.70 | 12.90 | 15.90 | 18.85 |
| Youngstown S41 | 8.95 | 10.40 | 12.60 | 15.60 | 18.55 |

| Spring Steel (Tempered) | Up to 0.80C | 0.81-1.05C | 1.06-1.35C |
|---|---|---|---|
| Bristol,Conn. W1 | 18.85 | 22.95 | 27.80 |
| Buffalo W12 | 18.85 | .... | .... |
| Fostoria,O. S1 | 19.05 | 22.15 | .... |
| FranklinPark,Ill. T6 | 19.20 | 23.30 | 28.15 |
| Harrison,N.J. C18 | 18.85 | 22.95 | 27.80 |
| NewYork W3 | 18.85 | 22.95 | 27.80 |
| Palmer,Mass. W12 | 18.85 | .... | .... |
| Trenton,N.J. R5 | 18.85 | 22.95 | 27.80 |
| Worcester,Mass. A7, T6 | 18.85 | 22.95 | 27.80 |
| Youngstown S41 | 19.20 | 23.30 | 28.15 |

| | |
|---|---|
| Weirton,W.Va. W6 | 10.80 |
| Youngstown Y1 | 10.80 |

**STRIP, Cold-Rolled Ingot Iron**

| | |
|---|---|
| Warren,O. R2 | 8.175 |

**STRIP, C. R. Electrogalvanized**

| | |
|---|---|
| Cleveland A7 | 7.425* |
| Dover,O. G6 | 7.425* |
| Evanston,Ill. M22 | 7.525* |
| McKeesport,Pa. E10 | 7.50* |
| Riverdale,Ill. A1 | 7.525* |
| Warren,O. B9, S3, T5 | 7.425* |
| Worcester,Mass. A7 | 7.975 |
| Youngstown S41, Y1 | 7.425* |

*Plus galvanizing extras.

**STRIP, Galvanized**
**(Continuous)**

| | |
|---|---|
| Farrell,Pa. S3 | 7.50 |
| Sharon,Pa. S3 | 7.50 |

**TIGHT COOPERAGE HOOP**

| | |
|---|---|
| Atlanta A11 | 5.65 |
| Farrell,Pa. S3 | 5.525 |
| Riverdale,Ill. A1 | 5.675 |
| Sharon,Pa. S3 | 5.525 |
| Youngstown U5 | 5.525 |

## TIN MILL PRODUCTS

| TIN PLATE, Electrolytic (Base Box) | 0.25 lb | 0.50 lb | 0.75 lb |
|---|---|---|---|
| Aliquippa,Pa. J5 | $9.10 | $9.35 | $9.75 |
| Fairfield,Ala. T2 | 9.20 | 9.45 | 9.85 |
| Fairless,Pa. U5 | 9.20 | 9.45 | 9.85 |
| Fontana,Calif. K1 | 9.75 | 10.00 | 10.40 |
| Gary,Ind. U5 | 9.10 | 9.35 | 9.75 |
| GraniteCity,Ill. G4 | 9.20 | 9.45 | 9.60 |
| IndianaHarbor,Ind. I-2, Y1 | 9.10 | 9.35 | 9.75 |
| Irvin,Pa. U5 | 9.10 | 9.35 | 9.75 |
| Niles,O. R2 | 9.10 | 9.35 | 9.75 |
| Pittsburg,Calif. C11 | 9.75 | 10.00 | 10.40 |
| SparrowsPoint,Md. B2 | 9.10 | 9.35 | 9.75 |
| Weirton,W.Va. W6 | 9.10 | 9.35 | 9.75 |
| Yorkville,O. W10 | 9.10 | 9.35 | 9.75 |

**ELECTROLYTIC TIN-COATED SHEET (Dollars per lb)**

| | | | |
|---|---|---|---|
| IndianaHarbor,Ind. Y1 (20-27 Ga.) | 7.90 | .... | .... |
| Niles,O. R2 (20-27 Ga.) | 7.90 | 8.10 | 8.30 |
| Aliquippa,Pa. J5 (21-27 Ga.) | 7.90 | 8.10 | .... |

| TIN PLATE, American | 1.25 lb | 1.50 lb |
|---|---|---|
| Aliquippa,Pa. J5 | $10.40 | $10.65 |
| Fairfield,Ala. T2 | 10.50 | 10.75 |
| Fairless,Pa. U5 | 10.50 | 10.75 |
| Fontana,Calif. K1 | 11.05 | 11 30 |
| Gary,Ind. U5 | 10.40 | 10 65 |
| Ind.Harb. Y1 | 10.40 | 10.65 |
| Pitts.,Calif. C11 | 11.05 | 11.30 |
| Sp.Pt.,Md. B2 | 10.40 | 10.65 |
| Weirton,W.Va. W6 | 10.40 | 10.65 |
| Yorkville,O. W10 | 10.40 | 10.65 |

| BLACK PLATE (Base Box) | |
|---|---|
| Aliquippa,Pa. J5 | $8.20 |
| Fairfield,Ala. T2 | 8.30 |
| Fairless,Pa. U5 | 8.30 |
| Fontana,Calif. K1 | 8.85 |
| Gary,Ind. U5 | 8.20 |
| GraniteCity,Ill. G4 | 8.30 |
| Ind.Harbor,Ind. I-2, Y1 | 8.20 |
| Irvin,Pa. U5 | 8.20 |
| Niles,O. R2 | 8.20 |
| Pittsburg,Calif. C11 | 8.85 |
| SparrowsPoint,Md. B2 | 8.20 |
| Weirton,W.Va. W6 | 8.20 |
| Yorkville,O. W10 | 8.20 |

**HOLLOWARE ENAMELING**
**Black Plate (29 Gage)**

| | |
|---|---|
| Aliquippa,Pa. J5 | 7.85 |
| Gary,Ind. U5 | 7.85 |
| GraniteCity,Ill. G4 | 7.95 |
| Ind.Harbor,Ind. Y1 | 7.85 |
| Irvin,Pa. U5 | 7.85 |
| Yorkville,O. W10 | 7.85 |

**MANUFACTURING TERNES**
**(Special Coated, aBse Box)**

| | |
|---|---|
| Gary,Ind. U5 | $10.05 |
| Irvin,Pa. U5 | 10.05 |

## SILICON STEEL

**C.R. COILS & CUT LENGTHS (22 Ga.)**

| Fully Processed (Semiprocessed ½c lower) | Field | Armature | Electric | Motor | Dynamo |
|---|---|---|---|---|---|
| Beech Bottom,W.Va. W10 | .... | 11.70 | 12.40 | 13.35 | 14.65 |
| Brackenridge,Pa. A4 | .... | .... | 12.40 | 13.55 | 14.65 |
| GraniteCity,Ill. G4 | 9.975* | 11.30* | 12.00* | 13.15* | .... |
| IndianaHarbor,Ind. I-2 | 9.875* | 11.20* | 11.90* | 13.05* | .... |
| Mansfield,O. E6 | 9.875* | 11.70 | 12.40 | 13.55 | 14.65 |
| Newport,Ky. A2 | 9.875 | 11.70* | 12.40* | 13.55* | 14.65* |
| Niles,O. M21 | 9.875* | 11.70 | 12.40 | 13.55 | .... |
| Vandergrift,Pa. U5 | 9.875* | 11.70 | 12.40 | 13.55 | 14.65 |
| Warren,O. R2 | 9.875* | 11.70 | 12.40 | 13.55 | 14.65 |
| Zanesville,O. A10 | .... | 11.70† | 12.40 | 13.55 | 14.65 |

| | Stator |
|---|---|
| Vandergrift,Pa. U5 | 8.10 |
| Mansfield,O. E6 | 8.10 |
| Warren,O. R2 (Silicon Lowcore) | 8.10 |

| SHEETS (22 Ga., coils & cut lengths) Fully Processed (Semiprocessed ½c lower) | T-72 | T-65 | T-58 | T-52 |
|---|---|---|---|---|
| BeechBottom,W.Va. W10 | 15.70 | 16.30 | 16.80 | 17.85 |
| Vandergrift,Pa. U5 | 15.70 | 16.30 | 16.80 | 17.85 |
| Zanesville,O. A10 | 15.70 | 16.30 | 16.80 | 17.85 |

| C.R. COILS & CUT LENGTHS (22 Ga.) | Grain Oriented T-100 | T-90 | T-80 | T-73 | T-66 | T-72 |
|---|---|---|---|---|---|---|
| Brackenridge,Pa. A4 | 18.10 | 19.70 | 20.20 | 20.70 | 15.70†† | |
| Butler,Pa. A10 | .... | 19.70 | 20.20 | 20.70 | .... | |
| Vandergrift,Pa. U5 | 17.10 | 18.10 | 19.70 | 20.20 | 20.70 | 15.70 |
| Warren,O. R2 | .... | .... | .... | .... | .... | 15.70‡ |

*Semiprocessed. †Fully processed only. ‡Coils, annealed; semiprocessed ½c lower. ††Coils only.

## WIRE

**WIRE, Manufacturers Bright, Low Carbon**

| | |
|---|---|
| AlabamaCity,Ala. R2 | 8.00 |
| Aliquippa,Pa. J5 | 8.00 |
| Alton,Ill. L1 | 8.20 |
| Atlanta A1 | 8.00 |
| Bartonville,Ill. K4 | 8.10 |
| Buffalo W12 | 8.00 |
| Chicago W13 | 8.00 |
| Cleveland A7, C20 | 8.00 |
| Crawfordsville,Ind. MS | 8.10 |
| Donora,Pa. A7 | 8.00 |
| Duluth A7 | 8.00 |
| Fairfield,Ala. T2 | 8.00 |
| Fostoria,O.(24) S1 | 8.10 |
| Houston S5 | 8.25 |
| Jacksonville,Fla. M8 | 8.35 |
| Johnstown,Pa. B2 | 8.00 |
| Joliet,Ill. A7 | 8.00 |
| KansasCity,Mo. S5 | 8.25 |
| Kokomo,Ind. C16 | 8.10 |
| LosAngeles B3 | 8.95 |
| Minnequa,Colo. C10 | 8.25 |
| Monessen,Pa. P7, P16 | 8.00 |
| N.Tonawanda,N.Y. B11 | 8.00 |
| Palmer,Mass. W12 | 8.30 |
| Pittsburg,Calif. C11 | 8.95 |
| Portsmouth,O. P12 | 8.00 |
| Rankin,Pa. A7 | 8.00 |
| S.Chicago,Ill. R2 | 8.00 |
| S.SanFrancisco C10 | 8.95 |
| SparrowsPoint,Md. B2 | 8.10 |
| Sterling,Ill.(1) N15 | 8.00 |
| Sterling,Ill. N15 | 8.10 |
| Struthers,O. Y1 | 8.00 |
| Waukegan,Ill. A7 | 8.00 |
| Worcester,Mass. A7 | 8.30 |

**WIRE, Cold Heading Carbon**

| | |
|---|---|
| Elyria,O. W8 | 8.00 |

**WIRE, Gal'd., for ACSR**

| | |
|---|---|
| Bartonville,Ill. K4 | 12.65 |
| Buffalo W12 | 13.40 |
| Cleveland A7 | 12.65 |
| Donora,Pa. A7 | 12.65 |
| Duluth A7 | 12.65 |
| Johnstown,Pa. B2 | 13.40 |
| KansasCity,Mo. U3 | 12.90 |
| Minnequa,Colo. C10 | 12.775 |
| Monessen,Pa. P7, P16 | 12.65 |
| Muncie,Ind. I-7 | 13.60 |
| NewHaven,Conn. A7 | 12.95 |
| Palmer,Mass. W12 | 13.70 |
| Pittsburg,Calif. C11 | 13.45 |
| Portsmouth,O. P12 | 12.65 |
| Roebling,N.J. R5 | 12.95 |
| SparrowsPt.,Md. B2 | 13.50 |
| Struthers,O. Y1 | 13.40 |
| Trenton,N.J. A7 | 12.95 |
| Waukegan,Ill. A7 | 12.65 |
| Worcester,Mass. A7 | 12.95 |

**WIRE, Upholstery Spring**

| | |
|---|---|
| Aliquippa,Pa. J5 | 9.75 |
| Alton,Ill. L1 | 9.95 |
| Buffalo W12 | 9.75 |
| Cleveland A7 | 9.75 |
| Donora,Pa. A7 | 9.75 |
| Duluth A7 | 9.75 |
| Johnstown,Pa. B2 | 9.75 |
| KansasCity,Mo. S5, U3 | 10.00 |
| LosAngeles B3 | 10.70 |
| Minnequa,Colo. C10 | 9.95 |
| Monessen,Pa. P7, P16 | 9.75 |
| NewHaven,Conn. A7 | 10.05 |
| Palmer,Mass. W12 | 10.05 |
| Pittsburg,Calif. C11 | 10.70 |
| Portsmouth,O. P12 | 9.75 |
| Roebling,N.J. R5 | 10.05 |
| S.Chicago,Ill. R2 | 9.75 |
| S.SanFrancisco C10 | 10.70 |
| SparrowsPt.,Md. B2 | 9.85 |
| Struthers,O. Y1 | 9.75 |
| Trenton,N.J. A7 | 10.05 |
| Waukegan,Ill. A7 | 9.75 |
| Worcester,Mass. A7, J4, T6 | 10.05 |

**WIRE, MB Spring, High-Carbon**

| | |
|---|---|
| Aliquippa,Pa. J5 | 9.75 |
| Alton,Ill. L1 | 9.95 |
| Bartonville,Ill. K4 | 9.85 |
| Buffalo W12 | 9.75 |
| Cleveland A7 | 9.75 |
| Donora,Pa. A7 | 9.75 |
| Duluth A7 | 9.75 |
| Fostoria,O. S1 | 9.80 |
| Johnstown,Pa. B2 | 9.75 |
| KansasCity,Mo. S5, U3 | 10.00 |
| LosAngeles B3 | 10.70 |
| Milbury,Mass.(12) N6 | 10.05 |
| Minnequa,Colo. C10 | 9.95 |
| Monessen,Pa. P7, P16 | 9.75 |
| Muncie,Ind. I-7 | 9.95 |
| Palmer,Mass. W12 | 10.05 |
| Pittsburg,Calif. C11 | 10.70 |
| Portsmouth,O. P12 | 9.75 |
| Roebling,N.J. R5 | 10.05 |
| S.Chicago,Ill. R2 | 9.75 |
| S.SanFrancisco C10 | 10.70 |
| SparrowsPt.,Md. B2 | 9.85 |
| Struthers,O. Y1 | 9.75 |
| Trenton,N.J. A7 | 10.05 |
| Waukegan,Ill. A7 | 9.75 |
| Wor'ster,Mass.A7,J4,T6 | 10.05 |

**WIRE, Fine & Weaving(8" Coils)**

| | |
|---|---|
| Alton,Ill. L1 | 16.50 |
| Bartonville,Ill. K4 | 16.40 |
| Chicago W13 | 16.30 |
| Cleveland A7 | 16.30 |
| Crawfordsville,Ind. MS | 16.40 |
| Fostoria,O. S1 | 16.30 |
| Houston S5 | 16.55 |
| Jacksonville,Fla. MS | 16.65 |
| Johnstown,Pa. B2 | 16.30 |
| KansasCity,Mo. S5 | 16.55 |
| Kokomo,Ind. C16 | 16.30 |
| Minnequa,Colo. C10 | 16.55 |
| Monessen,Pa. P16 | 16.30 |
| Muncie,Ind. I-7 | 16.50 |
| Palmer,Mass. W12 | 16.60 |
| S.SanFrancisco C10 | 17.15 |
| Waukegan,Ill. A7 | 16.30 |
| Worcester,Mass. A7, J6 | 16.60 |

**WIRE, Tire Bead**

| | |
|---|---|
| Bartonville,Ill. K4 | 17.15 |
| Monessen,Pa. P16 | 17.15 |
| Roebling,N.J. R5 | 17.65 |

**ROPE WIRE (A)**

| | |
|---|---|
| Bartonville,Ill. K4 | 13.45 |
| Buffalo W12 | 13.45 |
| Fostoria,O. S1 | 13.45 |
| KansasCity,Mo. U3 | 13.70 |
| Johnstown,Pa. B2 | 13.45 |
| Monessen,Pa. P7 | 13.45 |
| Muncie,Ind. I-7 | 13.65 |
| Palmer,Mass. W12 | 13.75 |
| Portsmouth,O. P12 | 13.45 |
| Roebling,N.J. R5 | 13.75 |
| St.Louis L8 | 13.45 |
| SparrowsPt.,Md. B2 | 13.55 |
| Struthers,O. Y1 | 13.45 |
| Worcester,Mass. J4 | 13.75 |

(A) Plow and Mild Plow; add 0.25c for Improved Plow.

**WIRE, Cold-Rolled Flat**

| | |
|---|---|
| Anderson,Ind. G6 | 12.35 |
| Baltimore T6 | 12.65 |
| Boston T6 | 12.65 |
| Buffalo W12 | 12.35 |
| Chicago W13 | 12.45 |
| Cleveland A7 | 12.35 |
| Crawfordsville,Ind. M8 | 12.35 |
| Dover,O. G6 | 12.35 |
| Farrell,Pa. S3 | 12.35 |
| Fostoria,O. S1 | 12.35 |
| FranklinPark,Ill. T6 | 12.45 |
| Kokomo,Ind. C16 | 12.35 |
| Massillon,O. R8 | 12.35 |
| Milwaukee C23 | 12.55 |
| Monessen,Pa. P7, P16 | 12.35 |
| Palmer,Mass. W12 | 12.65 |
| Pawtucket,R. I. N8 | 11.95 |
| Philadelphia P24 | 12.65 |
| Riverdale,Ill. A1 | 12.45 |
| Rome,N.Y. R6 | 12.35 |
| Sharon,Pa. S3 | 12.35 |
| Trenton,N.J. R5 | 12.65 |
| Warren,O. B9 | 12.35 |
| Worcester,Mass. A7,T6 | 12.65 |

**NAILS, Stock** — **Col.**

| | |
|---|---|
| AlabamaCity,Ala. R2 | 173 |
| Aliquippa,Pa. J5 | 173 |
| Atlanta A11 | 175 |
| Bartonville,Ill. K4 | 175 |
| Chicago W13 | 173 |
| Cleveland A9 | 173 |
| Crawfordsville,Ind. M8 | 175 |
| Donora,Pa. A7 | 173 |
| Duluth A7 | 173 |
| Fairfield,Ala. T2 | 173 |
| Houston S5 | 178 |
| Jacksonville,Fla. M8 | 175 |
| Johnstown,Pa. B2 | 173 |
| Joliet,Ill. A7 | 173 |
| KansasCity, Mo. S5 | 178 |
| Kokomo,Ind. C16 | 175 |
| Minnequa,Colo. C10 | 178 |
| Monessen,Pa. P7 | 173 |
| Pittsburg,Calif. C11 | 192 |
| Rankin,Pa. A7 | 173 |
| S. Chicago,Ill. R2 | 173 |
| SparrowsPt, Md. B2 | 175 |
| Sterling,Ill. (7) N15 | 175 |
| Worcester,Mass. A7 | 179 |

**(To Wholesalers; per cwt)**

| | |
|---|---|
| Galveston,Tex. D7 | 10.30 |

**NAILS, Cut (100 lb keg) To Distributors (33)**

| | |
|---|---|
| Wheeling,W.Va. W10 | 10.10 |

**POLISHED STAPLES** — **Col.**

| | |
|---|---|
| AlabamaCity,Ala. R2 | 175 |
| Aliquippa,Pa. J5 | 173 |
| Atlanta A11 | 177 |
| Bartonville,Ill. K4 | 175 |
| Crawfordsville,Ind. M8 | 177 |
| Donora,Pa. A7 | 173 |
| Duluth A7 | 173 |
| Fairfield,Ala. T2 | 173 |
| Houston S5 | 180 |
| Jacksonville,Fla. M8 | 177 |
| Johnstown,Pa. B2 | 175 |
| Joliet,Ill A7 | 173 |
| KansasCity,Mo. S5 | 180 |
| Kokomo,Ind. C16 | 177 |
| Minnequa,Colo. C10 | 180 |
| Pittsburg,Calif. C11 | 194 |
| Rankin,Pa. A7 | 173 |
| S.Chicago,Ill. R2 | 175 |
| Sparrows Pt.,Md. B2 | 177 |
| Sterling,Ill. (7) N15 | 175 |
| Worcester,Mass. A7 | 181 |

**TIE WIRE, Automatic Baler (14½ Ga.)(per 97 lb Net Box) Coil No. 3150**

| | |
|---|---|
| AlabamaCity,Ala. R2 | 9.24 |
| Atlanta A11 | 10.36 |
| Bartonville,Ill. K4 | 9.34 |
| Buffalo W12 | 10.26 |
| Chicago W13 | 9.24 |
| Crawfordsville,Ind. M8 | 9.34 |
| Donora,Pa. A7 | 9.24 |
| Duluth A7 | 9.24 |
| Fairfield,Ala. T2 | 9.24 |
| Houston S5 | 10.51 |
| Jacksonville,Fla. M8 | 9.34 |
| Johnstown,Pa. B2 | 10.26 |
| Joliet,Ill. A7 | 9.24 |
| KansasCity,Mo. S5 | 10.51 |
| Kokomo,Ind. C16 | 9.34 |
| LosAngeles B3 | 11.05 |
| Minnequa,Colo. C10 | 10.51 |
| Pittsburg,Calif. C11 | 9.94 |
| S.Chicago, Ill. R2 | 9.24 |
| S.SanFrancisco C10 | 11.04 |
| SparrowsPt.,Md. B2 | 10.36 |
| Sterling,Ill. (37) N15 | 9.24 |

**Coil No. 6500 Stand.**

| | |
|---|---|
| AlabamaCity,Ala. R2 | 9.54 |
| Atlanta A11 | 10.70 |
| Bartonville,Ill. K4 | 9.64 |
| Buffalo W12 | 10.60 |
| Chicago W13 | 9.54 |
| Crawfordsville,Ind. M8 | 9.64 |
| Donora,Pa. A7 | 9.54 |
| Duluth A7 | 9.54 |
| Fairfield,Ala. T2 | 9.54 |
| Houston S5 | 10.85 |
| Jacksonville,Fla. M8 | 9.64 |
| Johnstown,Pa. B2 | 10.60 |
| Joliet,Ill. A7 | 9.54 |
| KansasCity,Mo. S5 | 10.85 |
| Kokomo,Ind C16 | 9.64 |
| LosAngeles B3 | 11.40 |
| Minnequa,Colo. C10 | 10.85 |
| Pittsburg,Calif. C11 | 10.26 |
| S.Chicago,Ill. R2 | 9.54 |
| S.SanFrancisco C10 | 11.40 |
| SparrowsPt.,Md. B2 | 10.70 |
| Sterling,Ill.(37) N15 | 9.54 |

**Coil No. 6500 Interim**

| | |
|---|---|
| AlabamaCity,Ala. R2 | 9.59 |
| Atlanta A11 | 10.75 |
| Bartonville,Ill. K4 | 9.69 |
| Buffalo W12 | 10.65 |
| Chicago W13 | 9.59 |
| Crawfordsville,Ind. M8 | 9.69 |
| Donora,Pa. A7 | 9.59 |
| Duluth A7 | 9.59 |
| Fairfield,Ala. T2 | 9.59 |
| Houston S5 | 10.90 |
| Jacksonville,Fla. M8 | 9.69 |
| Johnstown,Pa. B2 | 10.65 |
| Joliet,Ill. A7 | 9.59 |
| KansasCity,Mo. S5 | 10.90 |
| Kokomo,Ind. C16 | 9.69 |
| LosAngeles B3 | 11.45 |
| Minnequa,Colo. C10 | 10.90 |
| PittsburgCalif. C11 | 10.31 |
| S.Chicago,Ill. R2 | 9.59 |
| S.SanFrancisco C10 | 11.45 |
| SparrowsPt.,Md. B2 | 10.75 |
| Sterling,Ill.(37) N15 | 9.59 |

**BALE TIES, Single loop** — **Col.**

| | |
|---|---|
| AlabamaCity,Ala. R2 | 212 |
| Atlanta A11 | 214 |
| Bartonville,Ill. K4 | 214 |
| Crawfordsville,Ind. M8 | 214 |
| Donora,Pa. A7 | 212 |
| Duluth A7 | 212 |
| Fairfield,Ala. T2 | 212 |
| Houston S5 | 217 |
| Jacksonville,Fla. M8 | 214 |
| Joliet,Ill. A7 | 212 |
| KansasCity,Mo. S5 | 217 |
| Kokomo,Ind. C16 | 214 |
| Minnequa,Colo. C10 | 217 |
| Pittsburg,Calif. C11 | 236 |
| S.SanFrancisco C10 | 236 |
| SparrowsPt.,Md. B2 | 214 |
| Sterling,Ill.(7) N15 | 214 |

**FENCE POSTS**

| | |
|---|---|
| Birmingham C15 | 177 |
| ChicagoHts.,Ill. C2, I-2 | 177 |
| Duluth A7 | 177 |
| Franklin,Pa. F5 | 177 |
| Johnstown,Pa. B2 | 177 |
| Marion,O. P11 | 177 |
| Minnequa,Colo. C10 | 182 |
| Tonawanda,N.Y. B12 | 177 |

**WIRE, Barbed** — **Col.**

| | |
|---|---|
| AlabamaCity,Ala. R2 | 193** |
| Aliquippa,Pa. J5 | 190§ |
| Atlanta A11 | 198§ |
| Bartonville,Ill. K4 | 198 |
| Crawfordsville,Ind. M8 | 198 |
| Donora,Pa. A7 | 193† |
| Duluth A7 | 193† |
| Fairfield,Ala. T2 | 193† |
| Houston S5 | 198** |
| Jacksonville,Fla. M8 | 198 |
| Johnstown,Pa. B2 | 196§ |
| Joliet,Ill. A7 | 193† |
| KansasCity,Mo. S5 | 198** |
| Kokomo,Ind. C16 | 195† |
| Minnequa,Colo. C10 | 198** |
| Monessen,Pa. P7 | 196§ |
| Pittsburg,Calif. C11 | 213† |
| Rankin,Pa. A7 | 193† |
| S.Chicago,Ill. R2 | 193** |
| S.SanFrancisco C10 | 213* |
| SparrowsPoint,Md. B2 | 198§ |
| Sterling,Ill.(7) N15 | 198†† |

**WOVEN FENCE, 9-15 Ga.** — **Col.**

| | |
|---|---|
| Ala.City,Ala. R2 | 187** |
| Aliq'ppa,Pa.9-11½ga.J5 | 190§ |
| Atlanta A11 | 192§ |
| Bartonville,Ill. K4 | 192 |
| Crawfordsville,Ind. M8 | 192 |
| Donora,Pa. A7 | 187† |
| Duluth A7 | 187† |
| Fairfield,Ala. T2 | 187† |
| Houston S5 | 192** |
| Jacksonville,Fla. M8 | 192 |
| Johnstown,Pa.(43) B2 | 190§ |
| Joliet,Ill. A7 | 187† |
| KansasCity,Mo. S5 | 192** |
| Kokomo,Ind. C16 | 192 |
| Minnequa,Colo. C10 | 192** |
| Pittsburg,Calif. C11 | 210† |
| Rankin,Pa. A7 | 187† |
| S.Chicago,Ill. R2 | 187** |
| Sterling,Ill.(7) N15 | 192†† |

| **WIRE (16 gage)** | **An'ld Stone** | **Galv. Stone** |
|---|---|---|
| Ala.City,Ala.R2 | 17.85 | 19.40** |
| Aliq'ppa,Pa. J5 | 17.85 | 19.65 |
| Bartonville K4 | 17.95 | 19.80 |
| Cleveland A7 | 17.85 | .... |
| Craw'dville M8 | 17.95 | 19.80‡‡ |
| Fostoria,O. S1 | 18.35 | 19.90† |
| Houston S5 | 18.10 | 19.65** |
| Jacksonville M8 | 17.95 | 19.80‡‡ |
| Johnstown B2 | 17.85 | 19.65§ |
| Kan.City,Mo. S5 | 18.10 | .... |
| Kokomo C16 | 17.25 | 18.80† |
| Minnequa C10 | 18.10 | 19.65** |
| P'lm'r,Mass.W12 | 18.15 | 19.70† |
| Pitts.,Calif. C11 | 18.20 | 19.75† |
| S.SanFran. C10 | 18.20 | 19.75** |
| St'ling(37) N15 | 17.25 | 19.05†† |
| SparrowsPt. B2 | 17.95 | 19.75§ |
| Waukegan A7 | 17.85 | 19.40† |
| Worcester A7 | 18.15 | .... |

**WIRE, Merchant Quality (6 to 8 gage)**

| | | |
|---|---|---|
| Ala.City,Ala. R2 | 9.00 | 9.55** |
| Aliquippa J5 | 8.65 | 9.325§ |
| Atlanta(48)A11 | 9.10 | 9.775§ |
| Bartonville(48) K4 | 9.10 | 9.80 |
| Buffalo W12 | 9.00 | 9.55† |
| Cleveland A7 | 9.00 | .... |
| Crawfordsville M8 | 9.10 | 9.80‡‡ |
| Donora,Pa. A7 | 9.00 | 9.55† |
| Duluth A7 | 9.00 | 9.55† |
| Fairfield T2 | 9.00 | 9.55† |
| Houston(48) S5 | 9.25 | 9.80** |
| Jack'ville,Fla. M8 | 9.10 | 9.80‡‡ |
| Johnstown(48) B2 | 9.00 | 9.675§ |
| Joliet,Ill. A7 | 9.00 | 9.55† |
| Kans.City(48) S5 | 9.25 | 9.80** |
| Kokomo(48) S16 | 9.10 | 9.65† |
| LosAngeles B3 | 9.95 | 10.625§ |
| Monessen(48) P7 | 8.65 | 9.35§ |
| Palmer,Mass. W12 | 9.30 | 9.85† |
| Pitts.,Calif. C11 | 9.95 | 10.50† |
| Rankin,Pa. A7 | 9.00 | 9.55† |
| S.Chicago R2 | 9.00 | 9.55** |
| S.SanFran. C10 | 9.95 | 10.50** |
| Spar'wsPt.(48)B2 | 9.10 | 9.775§ |
| St'ling(1)(48)N15 | 9.00 | 9.70§§ |
| Struthers,O. Y1 | 9.00 | 9.65† |
| Worcester,Mass.A7 | 9.30 | 9.85† |

Based on zinc price of: *13.50. †5c. §10c. ‡Less than 10c. ††10.50c. ‡‡11.00c. **Subject to zinc equalization extras. §§11.50c.

## FASTENERS

(Base discounts, shipments of one to four containers, per cent off list, f.o.b. mill)

**BOLTS**

**Machine Bolts**
Full Size Body (cut thread)
½ in. and smaller:
3 in. and shorter .. 55.0
3¼ in. thru 6 in. .. 50.0
Longer than 6 in. .. 37.0
⅝ in., 3 in. & shorter 47.0
3¼ in. thru 6 in. .. 40.0
Longer than 6 in. .. 31.0
¾ in. thru 1 in.:
6 in. and shorter .. 37.0
Longer than 6 in. .. 31.0
1¼ in. and larger:
All lengths ..... 31.0
Undersize Body (rolled thread)
½ in. and smaller:
3 in. and shorter .. 55.0
3¼ in. thru 6 in. .. 50.0
**Carriage Bolts**
Full Size Body (cut thread)& Undersize Body (rolled thread)
½ in. and smaller:
6 in. and shorter.. 48.0
Larger diameters and longer lengths ... 35.0
**Lag, Plow, Tap, Blank Step, Elevator, Tire, and Fitting Up Bolts**
½ in. and smaller:
6 in. and shorter .. 48.0
Larger diameters and longer lengths ... 35.0
**High Tensile Structural Bolts** (Reg. semifinished hex head bolts, heavy semifinished hex nuts. Bolts — High-carbon steel, heat treated. Spec. ASTM A-325, in bulk. Full keg quantity)
⅝ in. diam ..... 50.0
¾ in. diam ..... 47.0
⅞ and 1 in. diam. 43.0
1¼ and 1¼ in. diam 34.0

**NUTS**

(Keg or case quantity and over)
**Square Nuts, Reg. & Heavy:**
All sizes ..... 56.0
(Full container)
**Hex Nuts, Reg. & Heavy**
**Hot Pressed & Cold Punched:**
¾ in. and smaller.. 62.0
⅞ in. to 1½ in., incl. 56.0
1⅝ in. and larger .. 51.5
**Hex Nuts, Semifinished, Heavy (Incl. Slotted):**
¾ in. and smaller.. 62.0
⅞ in. to 1½ in. incl. 56.0
1⅝ in. and larger 51.5
**Hex Nuts, Finished (Incl. Slotted and Castellated):**
⅞ in. and smaller.. 65.0
1 in. to 1½ in., incl. 57.0
1⅝ in. and larger.. 51.5
**Semifinished Hex Nuts, Reg. (Incl. Slotted):**
⅝ in. and smaller.. 62.0
¾ in. to ⅞ in., incl. 65.0
1 in. to 1½ in., incl. 57.0
1⅝ in. and larger.. 51.5
**CAP AND SETSCREWS**
(Base discounts, packages, per cent off list, f.o.b. mill)
**Hex Head Cap Screws, Coarse or Fine Thread, Bright:**
6 in. and shorter:
⅝ in. and smaller.. 35.0
¾, ⅞, and 1 in. .. 16.0
Longer than 6 in.:
⅝ in. and smaller.. 3.0
¾, ⅞, and 1 in. ..+11.0
**High Carbon, Heat Treated:**
6 in. and shorter:
⅝ in. and smaller. 20.0
¾, ⅞, and 1 in. ..+ 5.0
Longer than 6 in.:
⅝ in. and smaller..+19.0
¾, ⅞, and 1 in. ..+39.0
**Flat Head Cap Screws:**
¾ in. and smaller, 6 in. and shorter ..+85.0
**Setscrews, Square Head, Cup Point, Coarse Thread:**
Through 1 in. diam:
6 in. and shorter ..+ 5.0
Longer than 6 in. ..+29.0

## RIVETS

F.o.b. Cleveland and/or freight equalized with Pittsburgh, f.o.b. Chicago and/or freight equalized with Birmingham except where equalization is too great.

Structural ½ in., larger 12.85, ⅞ in. and smaller by 6 in. and shorter; 15% off list.

## PRESTRESSED STRAND

(High strength, stress relieved; 7 wire uncoated. Net prices per 1000 ft, 40,000 lb and over)

| | Standard Diameter, Inches | | | | |
|---|---|---|---|---|---|
| | 1/4 | 5/16 | 3/8 | 7/16 | 1/2 |
| Alton,Ill. L1 | $28.95 | $43.40 | $55.40 | $73.00 | $95.10 |
| Buffalo W12 | 28.95 | 43.40 | 55.40 | 73.00 | 95.10 |
| Cleveland A7 | 28.95 | 43.40 | 55.40 | 73.00 | .... |
| KansasCity,Mo. U3 | 29.85 | 43.40 | 55.40 | 73.00 | 95.10 |
| Monessen,Pa. P16 | 32.15 | 48.20 | 61.55 | 81.10 | 105.65 |
| NewHaven,Conn. A7 | 28.95 | 43.40 | 55.40 | 73.00 | 95.10 |
| Pittsburg,Calif. C11 | 28.95 | 43.40 | 55.40 | 73.00 | 95.10 |
| Pueblo,Colo. W12 | 28.95 | 43.40 | 55.40 | 73.00 | 95.10 |
| Roebling,N.J. R5 | 28.95 | 43.40 | 55.40 | 73.00 | 95.10 |
| SparrowsPoint,Md. B2 | 28.95 | 43.40 | 55.40 | 73.00 | 95.10 |
| St.Louis L8 | 28.95 | 43.40 | 55.40 | 73.00 | 95.10 |
| Waukegan,Ill. A7 | 28.95 | 43.40 | 55.40 | 73.00 | 95.10 |

## RAILWAY MATERIALS

| | Standard No. 1 | Standard No. 2 | All No. 2 | Tee Rails 60 lb Under |
|---|---|---|---|---|
| Bessemer,Pa. U5 | 5.75 | 5.65 | .... | 6.725 |
| Ensley,Ala. T2 | 5.75 | 5.65 | .... | 6.725 |
| Fairfield,Ala. T2 | .... | .... | .... | 6.725 |
| Gary,Ind. U5 | 5.75 | 5.65 | .... | .... |
| Huntington,W.Va. C15 | .... | .... | .... | 6.725 |
| Johnstown,Pa. B2 | .... | .... | .... | (16)6.725 |
| Lackawanna,N.Y. B2 | 5.75 | 5.65 | .... | 6.725 |
| Minnequa,Colo. C10 | 5.75 | 5.65 | .... | 7.225 |
| Steelton,Pa. B2 | 5.75 | 5.65 | .... | .... |
| Williamsport,Pa. S19 | .... | .... | .... | 6.725 |

**TIE PLATES**

| | |
|---|---|
| Fairfield,Ala. T2 | 6.875 |
| Gary,Ind. U5 | 6.875 |
| Lackawanna,N.Y. B2 | 6.875 |
| Minnequa,Colo. C10 | 6.875 |
| Seattle B3 | 7.025 |
| Steelton,Pa. B2 | 6.875 |
| Torrance,Calif. C11 | 6.875 |

**JOINT BARS**

| | |
|---|---|
| Bessemer,Pa. U5 | 7.25 |
| Fairfield,Ala. T2 | 7.25 |
| Joliet,Ill. U5 | 7.25 |
| Lackawanna,N.Y. B2 | 7.25 |
| Minnequa,Colo. C10 | 7.25 |
| Steelton,Pa. B2 | 7.25 |

**AXLES**

| | |
|---|---|
| Ind.Harbor,Ind. S13 | 9.125 |
| Johnstown,Pa. B2 | 9.125 |

**TRACK BOLTS, Untreated**

| | |
|---|---|
| Cleveland R2 | 15.35 |
| KansasCity,Mo. S5 | 15.35 |
| Lebanon,Pa. B2 | 15.35 |
| Minnequa,Colo. C10 | 15.35 |
| Pittsburgh S44 | 14.75 |
| Seattle B3 | 15.85 |

**SCREW SPIKES**

| | |
|---|---|
| Lebanon,Pa. B2 | 15.10 |

**STANDARD TRACK SPIKES**

| | |
|---|---|
| Fairfield,Ala. T2 | 10.10 |
| Ind.Harbor,Ind. I-2,Y1 | 10.10 |
| KansasCity,Mo. S5 | 10.10 |
| Lebanon,Pa. B2 | 10.10 |
| Minnequa,Colo. C10 | 10.10 |
| Pittsburgh J5 | 10.10 |
| Seattle B3 | 10.60 |
| S.Chicago,Ill. R2 | 10.10 |
| Struthers,O. Y1 | 10.10 |
| Youngstown R2 | 10.10 |

**Footnotes**

(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant.
(4) Reinforcing.
(5) 1⅛ to under 1 7/16 in.; 1 7/16 to under 1 15/16 in., 6.70c; 1 15/16 to 8 in., inclusive, 7.05c.
(6) Chicago or Birm. base.
(7) Chicago base 2 cols. lower.
(8) 16 Ga. and heavier.
(9) Merchant quality; add 0.35c for special quality.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass., base.
(13) Add 0.25c for 17 Ga. & heavier.
(14) Gage 0.143 to 0.249 in.; for gage 0.142 and lighter, 5.80c.
(15) ⅜" and thinner.
(16) 40 lb and under.
(17) Flats only; 0.25 in. & heavier.
(18) To dealers.
(19) Chicago & Pitts. base.
(21) New Haven, Conn., base.
(22) Deld. San Francisco Bay area.
(23) Special quality.
(24) Deduct 0.05c, finer than 15 Ga.
(25) Bar mill bands.
(26) Deld. in mill zone, 6.295c.
(27) Bar mill sizes.
(28) Bonderized.
(29) Youngstown base.
(30) Sheared; for universal mill add 0.45c.
(31) Widths over ⅝ in.; 7.375c, for widths ⅝ in. and under by 0.125 in. and thinner.
(32) Buffalo base.
(33) To jobbers, deduct 20c.
(34) 9.60c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) Chicago base, 10 points lower.
(38) 13 Ga. & lighter; 60" & narrower.
(39) 48" and narrower.
(40) Lighter than 0.035"; 0.035" and heavier, 0.25c higher.
(41) 9.10c for cut lengths.
(42) Mill lengths, f.o.b. mill; deld. in mill zone or within switching limits, 5.635c.
(43) 9-14½ Ga.
(44) To fabricators.
(48) 6-7 Ga.
(49) 3½ in. and smaller rounds; 9.65c, over 3½ in. and other shapes.

## SEAMLESS STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

| Size—Inches | 2 | | 2½ | | 3 | | 3½ | | 4 | | 5 | | 6 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| List Per Ft | 37c | | 58.5c | | 76.5c | | 92c | | $1.09 | | $1.48 | | $1.92 | |
| Pounds Per Ft | 3.68 | | 5.82 | | 7.62 | | 9.20 | | 10.89 | | 14.81 | | 19.18 | |
| | Blk | Galv* | Blk | Galv* | Blk | Galv* | Blk | Galv* | Blk | Galv* | Blk | Galv* | Blk | Galv* |
| Aliquippa, Pa. J5 | +12.25 | +27.25 | +5.75 | +22.5 | +3.25 | +20 | +1.75 | +18.5 | +1.75 | +18.5 | +2 | +18.75 | 0.5 | +16.25 |
| Ambridge, Pa. N2 | +12.25 | .... | +5.75 | .... | +3.25 | .... | +1.75 | .... | +1.75 | .... | +2 | .... | 0.5 | .... |
| Lorain, O. N3 | +12.25 | +27.25 | +5.75 | +22.5 | +3.25 | +20 | +1.75 | +18.5 | +1.75 | +18.5 | +2 | +18.75 | 0.5 | +16.25 |
| Youngstown Y1 | +12.25 | +27.25 | +5.75 | +22.5 | +3.25 | +20 | +1.75 | +18.5 | +1.75 | +18.5 | +2 | +18.75 | 0.5 | +16.25 |

## ELECTRIC STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Youngstown R2 | +12.25 | +27.25 | +5.75 | +22.5 | +3.25 | +20 | +1.75 | +18.5 | +1.75 | +18.5 | +2 | +18.75 | 0.5 | +16.25 |

## BUTTWELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

| Size—Inches | ⅜ | | ¼ | | ⅜ | | ½ | | ¾ | | 1 | | 1¼ | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| List Per Ft | 5.5c | | 6c | | 6c | | 8.5c | | 11.5c | | 17c | | 23c | |
| Pounds Per Ft | 0.24 | | 0.42 | | 0.57 | | 0.85 | | 1.13 | | 1.68 | | 2.28 | |
| | Blk | Galv* | Blk | Galv* | Blk | Galv* | Blk | Galv* | Blk | Galv* | Blk | Galv* | Blk | Galv* |
| Aliquippa, Pa. J5 | .... | .... | .... | .... | .... | .... | 2.25 | +13 | 5.25 | +9 | 8.75 | +4.5 | 11.25 | +3.75 |
| Alton, Ill. L1 | .... | .... | .... | .... | .... | .... | 0.25 | +15 | 3.25 | +11 | 6.75 | +6.5 | 9.25 | +5.75 |
| Benwood, W. Va. W10 | 1.5 | +25 | +10.5 | +34 | −21 | +42.5 | 2.25 | +13 | 5.25 | +9 | 8.75 | +4.5 | 11.25 | +3.75 |
| Butler, Pa. F6 | 4.5 | +22 | +8.5 | +32 | −19.5 | +41 | .... | .... | .... | .... | .... | .... | .... | .... |
| Etna, Pa. N2 | .... | .... | .... | .... | .... | .... | 2.25 | +13 | 5.25 | +9 | 8.75 | +4.5 | 11.25 | +3.75 |
| Fairless, Pa. N3 | .... | .... | .... | .... | .... | .... | 0.25 | +15 | 3.25 | +11 | 6.75 | +6.5 | 9.25 | +5.75 |
| Fontana, Calif. K1 | .... | .... | .... | .... | .... | .... | +10.75 | +26 | +7.75 | +22 | +4.25 | +17.5 | +1.75 | +16.75 |
| Indiana Harbor, Ind. Y1 | .... | .... | .... | .... | .... | .... | 1.25 | +14 | 4.25 | +10 | 7.75 | +5.5 | 10.25 | +6.25 |
| Lorain, O. N3 | .... | .... | .... | .... | .... | .... | 2.25 | +13 | 5.25 | +9 | 8.75 | +4.5 | 11.25 | +3.75 |
| Sharon, Pa. S4 | 4.5 | +22 | +8.5 | +32 | −19.5 | +41 | .... | .... | .... | .... | .... | .... | .... | .... |
| Sharon, Pa. M6 | .... | .... | .... | .... | .... | .... | 2.25 | +13 | 5.25 | +9 | 8.75 | +4.5 | 11.25 | +3.75 |
| Sparrows Pt., Md. B2 | 2.5 | +24 | +10.5 | +34 | −21.5 | +43 | 0.25 | +15 | 3.25 | +11 | 6.75 | +6.5 | 9.25 | +5.75 |
| Wheatland, Pa. W9 | 4.5 | +22 | +8.5 | +32 | −19.5 | +41 | 2.25 | +13 | 5.25 | +9 | 8.75 | +4.5 | 11.25 | +3.75 |
| Youngstown R2, Y1 | .... | .... | .... | .... | .... | .... | 2.25 | +13 | 5.25 | +9 | 8.75 | +4.5 | 11.25 | +3.75 |

| Size—Inches | 1½ | | 2 | | 2½ | | 3 | | 3½ | | 4 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| List Per Ft | 27.5c | | 37c | | 58.5c | | 76.5c | | 92c | | $1.09 | |
| Pounds Per Ft | 2.72 | | 3.68 | | 5.82 | | 7.62 | | 9.20 | | 10.89 | |
| | Blk | Galv* | Blk | Galv* | Blk | Galv* | Blk | Galv* | Blk | Galv* | Blk | Galv* |
| Aliquippa, Pa. J5 | 11.75 | +2.75 | 12.25 | +2.25 | 13.75 | +2.5 | 13.75 | +2.5 | 3.25 | +13.5 | 3.25 | +13.5 |
| Alton, Ill. L1 | 9.75 | +4.75 | 10.25 | +4.25 | 11.75 | +4.5 | 11.75 | +4.5 | 1.25 | +15.5 | 1.25 | +15.5 |
| Benwood, W. Va. W10 | 11.75 | +2.75 | 12.25 | +2.25 | 13.75 | +2.5 | 13.75 | +2.5 | 3.25 | +13.5 | 3.25 | +13.5 |
| Etna, Pa. N2 | 11.75 | +2.75 | 12.25 | +2.25 | 13.75 | +2.5 | 13.75 | +2.5 | 3.25 | +13.5 | 3.25 | +13.5 |
| Fairless, Pa. N3 | 9.75 | +4.75 | 10.25 | +4.25 | 11.75 | +4.5 | 11.75 | +5.5 | 1.25 | +15.5 | 1.25 | +15.5 |
| Fontana, Calif. K1 | +1.25 | +15.75 | +0.75 | +15.25 | 0.75 | +15.5 | 0.75 | +15.5 | +9.75 | +26.5 | +9.75 | +26.5 |
| Indiana Harbor, Ind. Y1 | 10.75 | +3.75 | 11.25 | +3.25 | 12.75 | +3.5 | 12.25 | +3.5 | 2.25 | +14.5 | 2.25 | +14.5 |
| Lorain, O. N3 | 11.75 | +2.75 | 12.25 | +2.25 | 13.75 | +2.5 | 13.75 | +3.5 | .... | .... | .... | .... |
| Sharon, Pa. M6 | 11.75 | +2.75 | 12.25 | +2.25 | 13.75 | +2.5 | 13.75 | +2.5 | .... | .... | .... | .... |
| Sparrows Pt., Md. B2 | 9.75 | +4.75 | 10.25 | +4.25 | 11.75 | +4.5 | 11.75 | +4.5 | 1.25 | +15.5 | 1.25 | +15.5 |
| Wheatland, Pa. W9 | 11.75 | +2.75 | 12.25 | +2.25 | 13.75 | +2.5 | 13.75 | +2.5 | 3.25 | +13.5 | 3.25 | +13.5 |
| Youngstown R2, Y1 | 11.75 | +2.75 | 12.25 | +2.25 | 13.75 | +2.5 | 13.75 | +2.5 | 3.25 | +13.5 | 3.25 | +13.5 |

*Galvanized pipe discounts based on price of zinc at 11.00c, East St. Louis.

# Stainless Steel

Representative prices, cents per pound; subject to current lists of extras

| AISI Type | —Rerolling— Ingot | Slabs | Forging Billets | H.R. Strip | H.R. Rods; C.F. Wire | Bars; Structural Shapes | Plates | Sheets | C.R. Strip; Flat Wire |
|---|---|---|---|---|---|---|---|---|---|
| 201 | 22.75 | 25.00 | .... | 36.00 | .... | 43.50 | 39.25 | 48.50 | 45.00 |
| 202 | 24.75 | 28.25 | 37.75 | 39.00 | 42.25 | 44.50 | 40.00 | 49.25 | 49.25 |
| 301 | 24.00 | 26.00 | 38.75 | 37.25 | 43.50 | 46.00 | 41.25 | 51.25 | 47.50 |
| 302 | 26.25 | 29.50 | 39.50 | 40.50 | 44.25 | 46.75 | 42.25 | 52.00 | 52.00 |
| 302B | 26.50 | 30.75 | 42.25 | 45.75 | 46.75 | 49.00 | 44.50 | 57.00 | 57.00 |
| 303 | .... | 33.25 | 42.50 | .... | 47.25 | 49.75 | 45.00 | 56.75 | 56.75 |
| 304 | 28.00 | 31.25 | 42.00 | 43.75 | 47.00 | 49.50 | 45.75 | 55.00 | 55.00 |
| 304L | .... | .... | 49.75 | 51.50 | 54.75 | 57.25 | 53.50 | 62.75 | 62.75 |
| 305 | 29.50 | 34.75 | 44.00 | 47.50 | 47.00 | 49.50 | 46.25 | 58.75 | 58.75 |
| 308 | 32.00 | 36.25 | 49.00 | 50.25 | 54.75 | 57.75 | 55.25 | 63.00 | 63.00 |
| 309 | 41.25 | 47.50 | 60.00 | 64.50 | 66.25 | 69.50 | 66.00 | 80.50 | 80.50 |
| 310 | 51.50 | 59.50 | 81.00 | 84.25 | 89.75 | 94.50 | 87.75 | 96.75 | 96.75 |
| 314 | .... | .... | 80.50 | .... | 89.75 | 94.50 | 87.75 | .... | 104.25 |
| 316 | 41.25 | 47.50 | 64.50 | 68.50 | 71.25 | 75.75 | 71.75 | 80.75 | 80.75 |
| 316L | .... | .... | 72.25 | 76.25 | 79.50 | 83.50 | 79.50 | 88.50 | 88.50 |
| 317 | 49.75 | 58.00 | 79.75 | 88.25 | 89.50 | 94.25 | 88.50 | 101.00 | 101.00 |
| 321 | 33.50 | 38.00 | 48.75 | 53.50 | 54.50 | 57.50 | 54.75 | 65.50 | 65.50 |
| 330 | .... | .... | 123.25 | .... | 113.00 | 143.75 | 135.00 | 149.25 | 149.25 |
| 18-8 CbTa | 38.50 | 48.25 | 57.75 | 63.50 | 63.75 | 67.25 | 64.75 | 79.25 | 79.25 |
| 403 | .... | .... | 29.25 | .... | 33.25 | 35.00 | 30.00 | 40.25 | 40.25 |
| 405 | 20.25 | 26.50 | 30.75 | 36.00 | 34.75 | 36.50 | 32.50 | 46.75 | 46.75 |
| 410 | 17.50 | 19.50 | 29.25 | 31.00 | 33.25 | 35.00 | 30.00 | 40.25 | 40.25 |
| 416 | .... | .... | 29.75 | .... | 33.75 | 35.50 | 31.25 | 48.25 | 48.25 |
| 420 | .... | 31.50 | 35.50 | 41.75 | 40.75 | 42.75 | 40.25 | 62.00 | 62.00 |
| 430 | 17.75 | 19.75 | 29.75 | 32.00 | 33.75 | 35.50 | 31.00 | 40.75 | 40.75 |
| 430F | .... | .... | 30.50 | .... | 34.25 | 36.00 | 31.75 | 51.75 | 51.75 |
| 431 | .... | 29.75 | 39.25 | .... | 43.50 | 46.00 | 41.00 | 56.00 | 56.00 |
| 446 | .... | .... | 40.75 | 59.00 | 46.00 | 48.25 | 42.75 | 70.00 | 70.00 |

**Producers Are:** Allegheny Ludlum Steel Corp.; American Steel & Wire Div., U. S. Steel Corp.; Anchor Drawn Steel Co., division of Vanadium-Alloys Steel Co.; Armco Steel Corp.; Babcock & Wilcox Co.; Bethlehem Steel Co.; J. Bishop & Co.; A. M. Byers Co.; Calstrip Steel Corp.; G. O. Carlson Inc.; Carpenter Steel Co.; Carpenter Steel Co. of New England; Charter Wire Products; Crucible Steel Co. of America; Damascus Tube Co.; Dearborn Div., Sharon Steel Corp.; Wilbur B. Driver Co.; Driver-Harris Co.; Eastern Stainless Steel Corp.; Firth Sterling Inc.; Fort Wayne Metals Inc.; Green River Steel Corp., subsidiary of Jessop Steel Co.; Indiana Steel & Wire Co.; Ingersoll Steel Div., Borg-Warner Corp.; Ellwood Ivins Steel Tube Works Inc.; Jessop Steel Co.; Johnson Steel & Wire Co. Inc.; Stainless & Strip Div., Jones & Laughlin Steel Corp.; Joslyn Stainless Steels, division of Joslyn Mfg. & Supply Co.; Latrobe Steel Co.; Lukens Steel Co.; Maryland Fine & Specialty Wire Co. Inc.; McLouth Steel Corp.; Metal Forming Corp.; Midvale-Heppenstall Co.; National Standard Co.; National Tube Div., U. S. Steel Corp.; Pacific Tube Co.; Page Steel & Wire Div., American Chain & Cable Co. Inc.; Pittsburgh Rolling Mills Inc.; Republic Steel Corp.; Riverside-Alloy Metal Div., H. K. Porter Company, Inc.; Rodney Metals Inc.; Sawhill Tubular Products Inc.; Sharon Steel Corp.; Simonds Saw & Steel Co.; Specialty Wire Co. Inc.; Standard Tube Co.; Superior Steel Div., Copperweld Steel Co.; Superior Tube Co.; Swepco Tube Corp.; Techalloy Co. Inc.; Timken Roller Bearing Co.; Trent Tube Co., subsidiary of Crucible Steel Co. of America; Tube Methods Inc.; Ulbrich Stainless Steel Inc.; Union Steel Corp.; U. S. Steel Corp.; Universal Cyclops Steel Corp.; Vanadium-Alloys Steel Co.; Wall Tube & Metal Products Co.; Wallingford Steel, subsidiary, Allegheny Ludlum Steel Corp.; Washington Steel Corp.; Seymour Mfg. Co.

# Clad Steel

| | Plates 5% | Plates Carbon Base 10% | Plates Carbon Base 15% | Plates Carbon Base 20% | Sheets Carbon Base 20% |
|---|---|---|---|---|---|
| Stainless | | | | | |
| 302 | .... | .... | .... | .... | 37.50 |
| 304 | 26.05 | 28.80 | 31.55 | 34.30 | 39.75 |
| 304L | 30.50 | 33.75 | 36.95 | 40.15 | .... |
| 316 | 38.20 | 42.20 | 46.25 | 50.25 | 58.25 |
| 316L | 42.30 | 46.75 | 51.20 | 55.65 | .... |
| 316 Cb | 49.90 | 55.15 | 60.40 | 65.65 | .... |
| 321 | 31.20 | 34.50 | 37.75 | 41.05 | 47.25 |
| 347 | 36.90 | 40.80 | 44.65 | 48.55 | 57.00 |
| 405 | 22.25 | 24.60 | 26.90 | 29.25 | .... |
| 410 | 20.55 | 22.70 | 24.85 | 27.00 | .... |
| 430 | 21.20 | 23.45 | 25.65 | 27.90 | .... |
| Inconel | 48.90 | 59.55 | 70.15 | 80.85 | .... |
| Nickel | 41.65 | 51.95 | 63.30 | 72.70 | .... |
| Nickel, Low Carbon | 41.95 | 52.60 | 63.30 | 74.15 | .... |
| Monel | 43.35 | 53.55 | 63.80 | 74.05 | .... |

| | Strip, Carbon Base Cold Rolled— 10% | Both Sides |
|---|---|---|
| Copper* | $36.20 | $43.15 |

*Deoxidized. Production points: Stainless-clad sheets, New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. C22, Coatesville, Pa. L7, New Castle, Ind. I-4, and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatesville L7; copper-clad strip, Carnegie, Pa. S18.

# Tool Steel

| Grade | $ per lb | Grade | $ per lb |
|---|---|---|---|
| Reg. Carbon (W-1) | 0.330 | V-Cr Hot Work (H-13) | 0.550 |
| Spec. Carbon (W-1) | 0.385 | W-Cr Hot Work (H-12) | 0.530 |
| Oil Hardening (O-1) | 0.505 | W Hot Wk. (H-21) | 1.425-1.44 |
| V-Cr Hot Work (H-11) | 0.505 | Hi-Carbon-Cr (D-II) | 0.955 |

| Grade by Analysis (%) W | Cr | V | Co | Mo | AISI Designation | $ per lb |
|---|---|---|---|---|---|---|
| 18 | 4 | 1 | .... | .... | T-1 | 1.840 |
| 18 | 4 | 2 | .... | .... | T-2 | 2.005 |
| 13.5 | 4 | 3 | .... | .... | T-3 | 2.105 |
| 18.25 | 4.25 | 1 | 4.75 | .... | T-4 | 2.545 |
| 18 | 4 | 2 | 9 | .... | T-5 | 2.915 |
| 20.25 | 4.25 | 1.6 | 12.95 | .... | T-6 | 4.330 |
| 13.75 | 3.75 | 2 | 5 | .... | T-8 | 2.485 |
| 1.5 | 4 | 1 | .... | 8.5 | M-1 | 1.200 |
| 6.4 | 4.5 | 1.9 | .... | 5 | M-2 | 1.345 |
| 6 | 4 | 3 | .... | 6 | M-3 | 1.590 |

Tool steel producers include: A4, A8, B2, B8, C4, C9, C12, C18, F2, J3, L3, M14, S8, U4, V2, and V3.

# Pig Iron

F.o.b. furnace prices in dollars per gross ton, as reported to STEEL. Minimum delivered prices are approximate.

| | Basic | No. 2 Foundry | Malle-able | Besse-mer |
|---|---|---|---|---|
| ***Birmingham District*** | | | | |
| Birmingham R2 | 62.00 | 62.50** | .... | .... |
| Birmingham U6 | .... | 62.50** | 66.50 | .... |
| Woodward,Ala. W15 | 62.00* | 62.50** | 66.50 | .... |
| Cincinnati, deld. | .... | 70.20 | .... | .... |
| ***Buffalo District*** | | | | |
| Buffalo H1, R2 | 66.00 | 66.50 | 67.00 | 67.50 |
| N.Tonawanda,N.Y. T9 | .... | 66.50 | 67.00 | 67.50 |
| Tonawanda,N.Y. W12 | 66.00 | 66.50 | 67.00 | 67.50 |
| Boston, deld. | 77.29 | 77.79 | 78.29 | .... |
| Rochester,N.Y., deld. | 69.02 | 69.52 | 70.02 | .... |
| Syracuse,N.Y., deld. | 70.12 | 70.62 | 71.12 | .... |
| ***Chicago District*** | | | | |
| Chicago I-3 | 66.00 | 66.50 | 66.50 | 67.00 |
| S.Chicago,Ill. R2 | 66.00 | 66.50 | 66.50 | 67.00 |
| S.Chicago,Ill. W14 | 66.00 | .... | 66.50 | 67.00 |
| Milwaukee, deld. | 69.02 | 69.52 | 69.52 | 70.02 |
| Muskegon,Mich., deld. | .... | 74.52 | 74.52 | .... |
| ***Cleveland District*** | | | | |
| Cleveland R2, A7 | 66.00 | 66.50 | 66.50 | 67.00 |
| Akron,Ohio, deld. | 69.52 | 70.02 | 70.02 | 70.52 |
| ***Mid-Atlantic District*** | | | | |
| Birdsboro, Pa. B10 | 68.00 | 68.50 | 69.00 | 69.50 |
| Chester,Pa. P4 | 68.00 | 68.50 | 69.00 | .... |
| Swedeland,Pa. A3 | 68.00 | 68.50 | 69.00 | 69.50 |
| NewYork, deld. | .... | 75.50 | 76.00 | .... |
| Newark,N.J., deld. | 72.69 | 73.19 | 73.69 | 74.19 |
| Philadelphia, deld. | 70.41 | 70.91 | 71.41 | 71.99 |
| Troy,N.Y. R2 | 68.00 | 68.50 | 69.00 | 69.50 |
| ***Pittsburgh District*** | | | | |
| NevilleIsland,Pa. P6 | 66.00 | 66.50 | 66.50 | 67.00 |
| Pittsburgh (N&S sides), Aliquippa, deld. | .... | 67.95 | 67.95 | 68.48 |
| McKeesRocks,Pa. deld. | .... | 67.60 | 67.60 | 68.13 |
| Lawrenceville,Homestead, Wilmerding,Monaca,Pa., deld. | .... | 68.26 | 68.26 | 68.79 |
| Verona,Trafford,Pa., deld. | 68.29 | 68.82 | 68.82 | 69.35 |
| Brackenridge,Pa., deld. | 68.60 | 69.10 | 69.10 | 69.63 |
| Midland,Pa. C18 | 66.00 | .... | .... | .... |
| ***Youngstown District*** | | | | |
| Hubbard,Ohio Y1 | .... | .... | 66.50 | .... |
| Sharpsville,Pa. S6 | 66.00 | .... | 66.50 | 67.00 |
| Youngstown Y1 | .... | .... | 66.50 | .... |
| Mansfield,Ohio, deld. | 71.30 | .... | 71.80 | 72.30 |
| Duluth I-3 | 66.00 | 66.50 | 66.50 | 67.00 |
| Erie,Pa. I-3 | 66.00 | 66.50 | 66.50 | 67.00 |
| Everett,Mass. E1 | 67.50 | 68.00 | 68.50 | .... |
| Fontana,Calif. K1 | 75.00 | 75.50 | .... | .... |
| Geneva,Utah C11 | 66.00 | 66.50 | .... | .... |
| Granite City,Ill. G4 | 67.90 | 68.40 | 68.90 | .... |
| Ironton,Utah C11 | 66.00 | 66.50 | .... | .... |
| Minnequa,Colo. C10 | 68.00 | 68.50 | 69.00 | .... |
| Rockwood,Tenn. T3 | .... | 62.50‡ | 66.50 | .... |
| Toledo,Ohio I-3 | 66.00 | 66.50 | 66.50 | 67.00 |
| Cincinnati, deld. | 72.94 | 73.44 | .... | .... |

*Phos. 0.70-0.90%; Phos. 0.30-0.69%, $63.
**Phos. 0.70-0.90%; Phos. 0.30-0.69%, $63.50.
‡Phos.0.50% up; Phos. 0.30-0.49%, $63.50.

## PIG IRON DIFFERENTIALS

*Silicon:* Add 75 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phos. iron on which base is 1.75-2.00%.

*Manganese:* Add 50 cents per ton for each 0.25% manganese over 1% or portion thereof.

## BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.01-6.50% silicon; add 75c for each 0.50% silicon or portion thereof over the base grade within a range of 6.50 to 11.50%; starting with silicon over 11.50% add $1.50 per ton for each 0.50% silicon or portion thereof up to 14%; add $1 for each 0.50% Mn over 1%)

| | |
|---|---|
| Jackson,Ohio I-3, J1 | $78.00 |
| Buffalo H1 | 79.25 |

## ELECTRIC FURNACE SILVERY IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1.25 for each 0.50% Mn over 1%; $2 per gross ton premium for 0.045% max P)

| | |
|---|---|
| CalvertCity,Ky. P15 | $99.00 |
| NiagaraFalls,N.Y. P15 | 99.00 |
| Keokuk,Iowa Open-hearth & Fdry, $9 freight allowed K2 | 103.50 |
| Keokuk,Iowa O.H. & Fdry, 12½ lb piglet, 16% Si, max fr'gt allowed up to $9, K2 | 106.50 |

## LOW PHOSPHORUS PIG IRON, Gross Ton

| | |
|---|---|
| Lyles,Tenn. T3 (Phos. 0.035% max) | $73.00 |
| Rockwood,Tenn. T3 (Phos 0.035% max) | 73.00 |
| Troy,N.Y. R2 (Phos. 0.035% max) | 73.00 |
| Philadelphia, deld. | 81.67 |
| Cleveland A7 (Intermediate) (Phos. 0.036-0.075% max) | 71.00 |
| Duluth I-3 (Intermediate) (Phos. 0.036-0.075%) | 71.00 |
| Erie,Pa. I-3 (Intermediate) (Phos. 0.036-0.075% max) | 71.00 |
| NevilleIsland,Pa. P6 (Intermediate) (Phos. 0.036-0.075% max) | 71.00 |

# Steel Service Center Products

Representative prices, per pound, subject to extras, f.o.b. warehouse. City delivery charges are 15 cents per 100 lb except: Denver, Moline, Norfolk, Richmond, Washington, 20 cents; Baltimore, Boston, Los Angeles, New York, Philadelphia, Portland, Spokane, San Francisco, 10 cents; Atlanta, Birmingham, Chattanooga, Houston, Seattle, no charge.

| | SHEETS | | | | STRIP | BARS | | | Standard Structural Shapes | PLATES | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Hot-Rolled | Cold-Rolled | Galv. 10 Ga.† | Stainless Type 302 | Hot-Rolled* | H.R. Rounds | C.F. Rds.‡ | H.R. Alloy 4140††[5] | | Carbon | Floor |
| Atlanta | 8.59§ | 9.86§ | 10.13 | .... | 8.91 | 9.39 | 13.24# | .... | 9.40 | 9.29 | 11.21 |
| Baltimore | 8.55 | 9.25 | 9.99 | .... | 9.05 | 9.45 | 11.85# | 15.48 | 9.55 | 9.00 | 10.50 |
| Birmingham | 8.18 | 9.45 | 10.46 | .... | 8.51 | 8.99 | .... | .... | 9.00 | 8.89 | 10.90 |
| Boston | 10.07 | 11.12 | 11.92 | 53.50 | 12.17 | 10.19 | 13.30# | 15.64 | 10.64 | 10.27 | 11.95 |
| Buffalo | 8.40 | 9.60 | 10.85 | 55.98 | 8.75 | 9.15 | 11.45# | 15.40 | 9.25 | 9.20 | 10.75 |
| Chattanooga | 8.35 | 9.69 | 9.65 | .... | 8.40 | 8.77 | 10.46 | .... | 8.88 | 8.80 | 10.66 |
| Chicago | 8.25 | 9.45 | 10.90 | 53.00 | 8.51 | 8.99 | 9.15 | 15.05 | 9.00 | 8.89 | 10.20 |
| Cincinnati | 8.43 | 9.51 | 10.95 | 53.43 | 8.83 | 9.31 | 11.53# | 15.37 | 9.56 | 9.27 | 10.53 |
| Cleveland | 8.36 | 9.54 | 11.00 | 52.33 | 8.63 | 9.10 | 11.25# | 15.16 | 9.39 | 9.13 | 10.44 |
| Dallas | 8.80 | 9.30 | .... | .... | 8.85 | 8.80 | .... | .... | 8.75 | 9.15 | 10.40 |
| Denver | 9.40 | 11.84 | 12.94 | .... | 9.43 | 9.80 | 11.19 | .... | 9.84 | 9.76 | 11.08 |
| Detroit | 8.51 | 9.71 | 11.25 | 56.50 | 8.88 | 9.30 | 9.51 | 15.33 | 9.56 | 9.26 | 10.46 |
| Erie, Pa. | 8.35 | 9.45 | 9.95[10] | .... | 8.60 | 9.10 | 11.25 | .... | 9.35 | 9.10 | 10.60 |
| Houston | 8.40 | 8.90 | 10.29 | 52.00 | 8.45 | 8.40 | 11.60 | 15.75 | 8.35 | 8.75 | 10.10 |
| Jackson, Miss. | 8.52 | 9.79 | .... | .... | 8.84 | 9.82 | 10.68 | .... | 9.33 | 9.22 | 11.03 |
| Los Angeles | 8.70[2] | 10.80[2] | 12.20 | 57.60 | 9.15 | 9.10[2] | 12.95[2] | 16.35 | 9.00[2] | 9.10[2] | 11.30[2] |
| Memphis, Tenn. | 8.59 | 9.80 | .... | .... | 8.84 | 9.32 | 11.25# | .... | 9.33 | 9.22 | 10.86 |
| Milwaukee | 8.39 | 9.59 | 11.04 | .... | 8.65 | 9.13 | 9.39 | 15.19 | 9.22 | 9.03 | 10.34 |
| Moline, Ill. | 8.55 | 9.80 | .... | .... | 8.84 | 8.95 | 9.15 | .... | 8.99 | 8.91 | .... |
| New York | 9.17 | 10.49 | 11.30 | 53.08 | 9.64 | 9.99 | 13.25# | 15.50 | 9.74 | 9.77 | 11.05 |
| Norfolk, Va. | 8.65 | .... | .... | .... | 9.15 | 9.30 | 12.75 | .... | 9.65 | 9.10 | 10.50 |
| Philadelphia | 8.20 | 9.25 | 10.61 | 52.71 | 9.25 | 9.40 | 11.95# | 15.48 | 9.10 | 9.15 | 10.40** |
| Pittsburgh | 8.35 | 9.55 | 10.90 | 52.00 | 8.61 | 8.99 | 11.25# | 15.05 | 9.00 | 8.89 | 10.20 |
| Richmond, Va. | 8.65 | .... | 10.79 | .... | 9.15 | 9.55 | .... | .... | 9.65 | 9.10 | 10.60 |
| St. Louis | 8.63 | 9.83 | 11.28 | .... | 8.89 | 9.37 | 9.78 | 15.43 | 9.48 | 9.27 | 10.58 |
| St. Paul | 8.79 | 10.04 | 11.49 | .... | 8.84 | 9.21 | 9.86 | .... | 9.38 | 9.30 | 10.49 |
| San Francisco | 9.65 | 11.10 | 11.40 | 55.10 | 9.75 | 10.15 | 13.60 | 16.25 | 9.85 | 10.00 | 12.35 |
| Seattle | 10.30 | 11.55 | 12.50 | 56.52 | 10.25 | 10.50 | 14.70 | 16.80[3] | 10.20 | 10.10 | 12.50 |
| South'ton, Conn. | 9.07 | 10.33 | 10.71 | .... | 9.48 | 9.74 | .... | .... | 9.57 | 9.57 | 10.91 |
| Spokane | 10.30 | 11.55 | 12.50 | 57.38 | 10.75 | 11.00 | 14.70 | 16.80 | 10.20 | 10.10 | 13.00 |
| Washington | 9.15 | .... | .... | .... | 9.65 | 10.05 | 12.50 | .... | 10.15 | 9.60 | 11.10 |

*Prices do not include gage extras; †prices include gage and coating extras; ‡includes 35-cent bar quality extras; §42 in. and under; **⅛ in. and heavier; ††as annealed; ‡‡¾ in. to 4 in. wide, inclusive; #net price, 1 in. round C-1018.

Base quantities, 2000 to 4999 lb except as noted; cold-finished bars, 2000 lb and over except in Seattle, 2000 to 3999 lb; stainless sheets, 8000 lb except in Chicago, New York, Boston, Seattle, 10,000 lb and in San Francisco, 2000 to 4999 lb; hot-rolled products on West Coast, 2000 to 9999 lb, except in Seattle, 30,000 lb and over; [2]—30,000 lb; [3]—1000 to 4999 lb; [5]—1000 to 1999 lb; [10]—2000 lb and over.

# Refractories

**Fire Clay Brick (per 1000 pieces*)**

*High-Heat Duty:* Ashland, Grahn, Hayward, Hitchens, Haldeman, Olive Hill, Ky., Athens, Troup, Tex., Beech Creek, Clearfield, Curwensville, Lock Haven, Lumber, Orviston, West Decatur, Winburne, Snow Shoe, Pa., Bessemer, Ala., Farber, Mexico, St. Louis, Vandalia, Mo., Ironton, Oak Hill, Parrall, Portsmouth, Ohio, Ottawa, Ill. Stevens Pottery, Ga., Canon City, Colo., $140; Salina, Pa., $145; Niles, Ohio, $138; Cutler, Utah, $175.

*Super-Duty:* Ironton, Ohio, Vandalia, Mo., Olive Hill, Ky., Clearfield, Salina, Winburne, Snow Shoe, Pa., New Savage, Md., St. Louis, $185; Stevens Pottery, Ga., $195; Cutler, Utah, $248.

**Silica Brick (per 1000 pieces*)**

*Standard:* Alexandria, Claysburg, Mt. Union, Sproul, Pa., Ensley, Ala., Pt. Matilda, Pa., Portsmouth, Ohio, Hawstone, Pa., St. Louis, $158; Warren, Niles, Windham, Ohio, Hays, Latrobe, Morrisville, Pa., $163; E. Chicago, Ind., Joliet, Rockdale, Ill., $168; Canon City, Colo., $173; Lehi, Utah, $183; Los Angeles, $185.

*Super-Duty:* Sproul, Hawstone, Pa., Niles, Warren, Windham, Ohio, Leslie, Md., Athens, Tex., $158; Morrisville, Hays, Latrobe, Pa., $163; E. Chicago, Ind., St. Louis, $168; Canon City, Colo., $183; Curtner, Calif., $185.

**Semisilica Brick (per 1000 pieces*)**

Woodbridge, N. J., Canon City, Colo., $140; Philadelphia, Clearfield, Pa., $145.

**Ladle Brick (per 1000 pieces*)**

*Dry Pressed:* Alsey, Ill., Chester, New Cumberland, W. Va., Freeport, Johnstown, Merrill Station, Vanport, Pa., Mexico, Vandalia, Mo., Wellsville, Irondale, New Salisbury, Ohio, $96.75; Clearfield, Pa., Portsmouth, Ohio, $102.

**High-Alumina Brick (per 1000 pieces*)**

50 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., Danville, Ill., $253; Philadelphia, $265; Clearfield, Pa., $230; Orviston, Snow Shoe, Pa., $260.

60 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $310; Danville, Ill., $313; Clearfield, Orviston, Snow Shoe, Pa., $320; Philadelphia, $325.

70 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $350; Danville, Ill., $353; Clearfield, Orviston, Snow Shoe, Pa., $360; Philadelphia, $365.

**Sleeves (per 1000)**

Reesdale, Johnstown, Bridgeburg, St. Charles, Pa., St. Louis, $188; Ottawa, Ill., $205.

**Nozzles (per 1000)**

Reesdale, Johnstown, Bridgeburg, St. Charles, Pa., St. Louis, $310.

**Runners (per 1000)**

Reesdale, Johnstown, Bridgeburg, St. Charles, Pa., $234.

**Dolomite (per net ton)**

Domestic, dead-burned, bulk, Billmeyer, Blue Bell Williams, Plymouth Meeting, York, Pa., Millville, W. Va., Bettsville, Millersville, Martin, Woodville, Gibsonburg, Narlo, Ohio, $16.75; Thornton, McCook, Ill., $17; Dolly Siding, Bonne Terre, Mo., $15.60.

**Magnesite (per net ton)**

Domestic, dead-burned, ½ in. grains with fines: Chewelah, Wash., Luning, Nev., $46; ⅜ in. grains with fines: Baltimore, $73.

*—9 in. x 4½ x 2.50 sts.

# Fluorspar

Metallurgical grades, f.o.b. shipping point in Ill., Ky., net tons, carloads, effective $CaF_2$ content 72.5%, $37-$41; 70%, $36-$40; 60%, $33-$36.50. Imported, net ton, f.o.b. cars point of entry, duty paid, metallurgical grade; European, $30-$33, contract; Mexican, all rail, duty paid, $25; barge, Brownsville, Tex., $27.

# Ores

**Lake Superior Iron Ore**

(Prices effective at start of the 1959 shipping season, subject to later revision, gross ton, 51.50% iron natural, rail of vessel, lower lake ports.)

| | |
|---|---|
| Mesabi bessemer | $11.60 |
| Mesabi nonbessemer | 11.45 |
| Old Range bessemer | 11.85 |
| Old Range nonbessemer | 11.70 |
| Open-hearth lump | 12.70 |
| High phos | 11.45 |

The foregoing prices are based on upper lake rail freight rates, lake vessel freight rates, handling and unloading charges, and taxes thereon, which were in effect Jan. 1, 1959, and increases or decreases after that date are absorbed by the seller.

**Eastern Local Iron Ore**

Cents per unit, deld. E. Pa.

| | |
|---|---|
| New Jersey, concentrates | nom. |

**Foreign Iron Ore**

Cents per unit, c.i.f. Atlantic ports

| | |
|---|---|
| Swedish basic, 65% | 21.00 |
| Brazilian iron ore, 68.5% | 22.60 |

**Tungsten Ore**

Net ton, unit

| | |
|---|---|
| Foreign wolframite, good commercial quality | $12.50-13.00* |
| Domestic, concentrates f.o.b. milling points | 16.00-17.00† |

*Before duty. †Nominal.

**Manganese Ore**

Mn 46-48%, Indian 91.5c-96.5c, nom. per long ton unit, c.i.f. U. S. ports, duty for buyer's account.

**Chrome Ore**

Gross ton, f.o.b. cars New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., Tacoma, Wash.

*Indian and Rhodesian*

| | |
|---|---|
| 48% 3:1 | $42.00-44.00† |
| 48% 2.8:1 | 38.00-40.00† |
| 48% no ratio | 29.00-31.00† |

*South African Transvaal*

| | |
|---|---|
| 44% no ratio | 19.75-21.00 |
| 48% no ratio | 29.00-31.00 |

*Turkish*

| | |
|---|---|
| 48% 3:1 | 51.00-55.00† |

*Domestic*

Rail nearest seller

| | |
|---|---|
| 18% 3:1 | 39.00 |

**Molybdenum**

| | |
|---|---|
| Sulfide concentrate, per lb of Mo content, mines, unpacked | $1.23 |

**Antimony Ore**

| | |
|---|---|
| Per short ton unit of Sb content, c.i.f. seaboard | |
| 50-55% | $2.25-2.40 |
| 60-65% | 2.50-3.10 |

**Vanadium Ore**

Cents per lb $V_2O_5$

| | |
|---|---|
| Domestic | 31.00 |

†Nominal.

# Canadian Steel

(Cents per pound, f.o.b. mill, except as otherwise noted)

| | |
|---|---|
| **Billets, Blooms & Slabs:** | |
| Carbon, Forging Quality (net ton) | $97.00 |
| Alloy (net ton) | 115.00 |
| **Wire Rods:** | |
| Carbon, $\frac{7}{32}$" to under ¼ in. | 5.30 |
| Carbon, ¼ in. to 47/64 in. | 5.70 |
| Alloy | 6.40 |
| **Wire (carload lots)** | 8.40 |
| **Bars & Small Shapes:** | |
| Carbon, merchant quality | 5.40 |
| Carbon, special quality | 5.85 |
| Alloy | 6.40 |
| **Bar Mill Bands:** | |
| Carbon | 5.40 |
| Alloy | 8.05 |
| **Structural Size Angles & Zees** | 5.40 |
| **Plates:** | |
| Carbon | 5.45 |
| **Sheets & Coils, Hot Rolled:** | |
| Carbon Sheets | 5.00 |
| Carbon Strip | 5.00 |
| **Sheets & Coils, Cold Rolled:** | |
| Carbon Sheet | 6.35 |
| Carbon Strip (0.080 and lighter) | 6.35 |
| Carbon Strip (0.081 and heavier) | 6.65 |
| **Sheets & Coils, Galvanized:** | |
| Standard Quality | 6.70 |
| Culvert Quality | 7.00 |
| **Sheets, Porcelain Enameling** | 7.45 |
| **Sheets & Coils, Electrical:** | |
| Field Grade | 9.00 |
| Armature Grade | 9.50 |
| Electrical Grade | 10.15 |
| **Tin Mill Products** (Per Base Box; 100 lb basis wt) | |
| Coke Tin Plate (1.25 lb pot yield) | $10.60 |
| Electrolytic Tin Plate (0.25 lb coating) | 9.10 |
| Black Plate | 8.30 |
| **Nails, c.l. lots,** (per keg) **400 keg min.** | $8.15 |

# Metal Powder

(Per pound f.o.b. shipping point in ton lots for minus 100 mesh, except as noted)

| | Cents |
|---|---|
| Sponge Iron, domestic and foreign, 98% Fe, min. trucklots, freight allowed east of Mississippi River: | |
| 100 mesh, bags | 11.25 |
| 100 mesh, pails | 9.10‡ |
| 40 mesh, bags | 8.10†† |
| Electrolytic Iron, Melting stock, 99.87% Fe, irreg. fragments, ⅛ in. x 1.3 in. | 28.75 |
| 1.3 in. | 28.75 |
| (In contract lots of 240 tons price is 22.75c) | |
| Annealed, 99.5% Fe | 36.50 |
| Unannealed (99+% Fe) | 36.00 |
| Unannealed (99+% Fe) (minus 325 mesh) | 59.00 |
| Powder Flake (minus 16, plus 100 mesh) | 29.00 |
| Carbonyl Iron: 98.1-98.9%, 3 to 20 microns, depending on grade, 93.00-290.00 in standard 200-lb containers; all minus 200 mesh. | |
| Aluminum: Atomized, 500-lb drum, freight allowed, cl. 38.50; ton lots 40.50. | |
| Antimony, 500-lb lots | 42.00* |
| *Brass, 5000-lb lots* | *34.10-50.70†* |
| *Bronze, 5000-lb lots* | *52.20-56.20†* |
| Copper, electrolytic | 14.25* |
| Copper, reduced | 14.25* |
| Lead | 7.50* |
| Manganese, Electrolytic: Minus 50 mesh | 43.00 |
| Nickel | 80.60 |
| *Nickel-Silver, 5000-lb lots* | *52.70-57.10†* |
| *Phosphor-Copper, 5000-lb lots* | *64.60* |
| *Copper (atomized) 5000-lb lots* | *45.10* |
| Solder | 7.00* |
| Stainless Steel, 304 | $0.89 |
| Stainless Steel, 316 | $1.07 |
| Tin | 14.00* |
| Zinc, 5000-lb lots | 19.00-32.20‡ |
| Tungsten: Carbon reduced, 98.8% min. minus 65 mesh | Dollars nom.** |
| Chromium, electrolytic 99.8% Cr. min metallic basis | 5.00 |

*Plus cost of metal. †Depending on composition. ‡Depending on mesh. §Cutting and scarfing grade. **Depending on price of ore. ††Welding grade.

# Metallurgical Coke

Price per net ton

**Beehive Ovens**

| | |
|---|---|
| Connellsville, Pa., furnace | $14.75-15.25 |
| Connellsville, Pa., foundry | 18.00-18.50 |

**Oven Foundry Coke**

| | |
|---|---|
| Birmingham, ovens | $30.35 |
| Cincinnati, deld. | 33.34 |
| Buffalo, ovens | 32.00 |
| Detroit, ovens | 32.00 |
| Pontiac, Mich., deld. | 33.95 |
| Saginaw, Mich., deld. | 35.53 |
| Erie, Pa., ovens | 32.00 |
| Everett, Mass., ovens: New England, deld. | 33.55* |
| Indianapolis, ovens | 31.25 |
| Ironton, Ohio, ovens | 30.50 |
| Cincinnati, deld. | 33.54 |
| Kearny, N. J., ovens | 31.25 |
| Milwaukee, ovens | 32.00 |
| Neville Island (Pittsburgh), Pa., ovens | 30.75 |
| Painesville, Ohio, ovens | 32.00 |
| Cleveland, deld. | 34.19 |
| Philadelphia, ovens | 31.00 |
| St. Louis, ovens | 33.00 |
| St. Paul, ovens | 31.25 |
| Chicago, deld. | 34.73 |
| Swedeland, Pa., ovens | 31.00 |
| Terre Haute, Ind., ovens | 31.25 |

*Within $5.15 freight zone from works.

# Imported Steel

(Base per 100 lb, landed, duty paid; based on current ocean rates with any rise for buyer's acc't. Source of shipment: Western Europe)

| | North Atlantic | Great Lakes | South Atlantic | Gulf Coast | West Coast |
|---|---|---|---|---|---|
| Deformed Bars, Intermediate, ASTM-A 305 | $5.80 | $5.80 | $5.75 | $5.65 | $6.11 |
| Bar Size Angles | 5.30 | 5.30 | 5.25 | 5.10 | 5.56 |
| Structural Angles | 5.68 | 5.68 | 5.63 | 5.53 | 5.98 |
| I-Beams | 5.31 | 5.31 | 5.31 | 5.21 | 5.65 |
| Channels | 5.26 | 5.26 | 5.26 | 5.16 | 5.60 |
| Plates (basic bessemer) | 5.65 | 5.65 | 5.60 | 5.50 | 5.96 |
| Sheets, H.R. | 8.30 | 8.30 | 8.30 | 8.10 | 8.60 |
| Sheets, Galvanized, 20 Ga., 36 in. x 96 in. | 9.52 | 9.52 | 9.47 | 9.37 | 9.83 |
| Sheets, Galv. (in coils) 20 Ga., 48 in. wide | 9.58 | 9.58 | 9.53 | 9.43 | 9.89 |
| Sheets, C.R. (drawing quality) | 8.75 | 8.75 | 8.75 | 8.60 | 9.12 |
| Furring Channels, C.R., 1000 ft, ⅞ x 0.30 lb per ft | 25.76 | 25.76 | 25.64 | 25.64 | 26.51 |
| Barbed Wire (†) | 6.68 | 6.68 | 6.58 | 6.52 | 6.75 |
| Merchant Bars | 5.90 | 5.90 | 5.85 | 5.65 | 6.11 |
| Hot-Rolled Bands | 7.15 | 7.15 | 7.15 | 7.15 | 7.55 |
| Wire Rods, Thomas Commercial No. 5 | 5.70 | 5.70 | 5.70 | 5.50 | 5.85 |
| Wire Rods, O.H. Cold Heading Quality No. 5 | 6.30 | 6.30 | 6.30 | 6.20 | 6.55 |
| Bright Common Wire Nails (‡) | 7.65 | 7.65 | 7.65 | 7.65 | 7.95 |

†Per 82 lb net reel. ‡Per 100-lb kegs, 20d nails and heavier.

# Coal Chemicals

(Representative prices)

Cents per gal f.o.b. tank cars or tank trucks, plant.

| | |
|---|---|
| Pure benzene | 31.00 |
| Xylene, industrial grade | 29.00 |
| Creosote | 24.00 |
| Naphthalene, 78 deg | 5.00 |
| Toluene, one deg (del. east of Rockies) | 25.00 |

Cents per lb, f.o.b. tank cars or tank trucks, deld.

| | |
|---|---|
| Phenol, 90 per cent grade | 14.75 |

Per net ton bulk, f.o.b. cars or trucks, plant

| | |
|---|---|
| Ammonium sulfate, regular grade | $32.00 |

# Ferroalloys

## MANGANESE ALLOYS

**Spiegeleisen:** Carlot, per gross ton, Palmerton, Neville Island, Pa. 21-23% Mn, $105; 19-21% Mn, 1-3% Si, $102.50; 16-19% Mn, $100.50.

**Standard Ferromanganese:** (Mn 74-76%, C 7% approx) base price per net ton, $245, Johnstown, Duquesne, Sheridan, Neville Island, Pa.; Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Portland, Oreg. Add or subtract $2 for each 1% or fraction thereof of contained manganese over 76% or under 74%, respectively (Mn 79-81%). Lump $253 per net ton, f.o.b. Anaconda or Great Falls, Mont. Add $2.60 for each 1% above 81%; subtract $2.60 for each 1% below 79%, fractions in proportion to nearest 0.1%.

**High-Grade Low-Carbon Ferromanganese:** (Mn 85-95%). Carload, lump, bulk, max 0.07% C, 35.1c per lb of contained Mn, carload packed 36.4c, ton lots 37.9c, less ton 39.1c. Delivered. Deduct 1.5c for max 0.15% C grade from above prices, 3c for max 0.03% C, 3.5c for max 0.5% C, and 6.5c for max 75% C—max 7% Si. **Special Grade:** (Mn 90% min, C 0.07% max. P 0.06% max). Add 2.05c to the above prices. Spot, add 0.25c.

**Medium-Carbon Ferromanganese:** (Mn 80-85%, C 1.25-1.5%, Si 1.5% max). Carload, lump, bulk, 25.5c per lb of contained Mn; packed, carload 26.8c, ton lot 28.4c, less ton 29.6c.

**Electrolytic Manganese Metal:** Min carload, bulk, 33.25c; 2000 lb to min carload, 36c; less ton, 38c; 50 lb cans, add 0.5c per lb. Premium for hydrogen-removed metal, 0.75c per lb. Prices are f.o.b. cars, Knoxville, Tenn., freight allowed to St. Louis or any point east of Mississippi River; or f.o.b. Marietta, O., freight allowed.

**Silicomanganese:** (Mn 65-68%). Carload, lump, bulk, 1.50% C grade, 18.5-21% Si, 12.8c per lb of alloy. Packed, c.l. 14c, ton 14.45c, less ton 15.45c, f.o.b. Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Portland, Oreg. For 2% C grade, Si 16-18.5%, deduct 0.2c from above prices. For 3% grade, Si 12.5-16%, deduct 0.4c from above prices. Spot, add 0.25c.

## TITANIUM ALLOYS

**Ferrotitanium, Low-Carbon:** (Ti 20-25%, Al 3.5% max, Si 4% max, C 0.10% max). Contract, ton lot, 2" x D, $1.50 per lb of contained Ti; less ton to 300 lb, $1.55. (Ti 38-43%, Al 8% max, Si 4% max, C 0.10% max). Ton lot $1.35, less ton to 300 lb $1.37, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis.

**Ferrotitanium, High-Carbon:** (Ti 15-18%, C 6-8%). Contract min c.l. $250 per ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi River and north of Baltimore and St. Louis. Spot $255.

**Ferrotitanium, Medium-Carbon:** (Ti 17-21%, C 2-4%). Contract, c.l. $300 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed. Spot, $305.

## CHROMIUM ALLOYS

**High-Carbon Ferrochrome:** C.l. lump, bulk, 28.75c per lb of contained Cr. Delivered.

**Charge Chrome 1:** Cr 63%, C 6% max, Si 7% max, 22c. Charge Chrome 2: Cr 50-59%, C 8% max, Si 6% max, 23c. Carload, lump, bulk, per lb Cr.

**Refined Chrome 1:** Cr 50-59%, C 5% max, Si 2% max, 25c. Refined Chrome 2: Si 12% max, 24c. Carload, lump, bulk, per lb Cr.

**Low-Carbon Ferrochrome:** Cr 63-66% (Simplex), carload, lump, bulk, C 0.025% max, 36.75c per lb contained Cr; 0.010% max, 37.75c. Delivered.

Cr 67-71%, carload, lump, bulk, 0.025% max, 39.75c; 0.05% max, 39.00c; 0.10% max, 38.50c; 0.20% max, 38.25c; 0.50% max, 38.00c; 1.0% max, 37.75c; 1.5% max, 37.50c; 2.0% max, 37.25c. Delivered.

**Foundry Ferrochrome, High-Carbon:** (Cr 62-66%, C 5-7%, Si 7-10%). C.l., 2" x D, bulk 30.8c per lb of contained Cr. Packed, c.l. 32.4c, ton 34.2c, less ton 35.7c. Delivered. Spot, add 0.25c.

**Foundry Ferrosilicon Chrome:** (Cr 50-54%, Si 28-32%, C 1.25% max). 8M x D, carload bulk 20.05c per lb of alloy, caroad packed, 21.25c, ton lot 22.50c; less ton lot 23.70c. Delivered. Spot, add 0.25c.

**Ferrochrome-Silicon:** Cr 39-41%, Si 42-45%, C 0.05% max or Cr 33-36%, Si 45-48%, C 0.05% max. Carload, lump, bulk, 3" x down and 2" x down, 28.25c per lb contained Cr, 14.60c per lb contained Si, 0.75" x down 29.40c per lb contained Cr, 14.60c per lb contained Si.

**Chromium Metal, Electrolytic:** Commercial grade (Cr 99.8% min, metallic basis, Fe 0.2% max). Contract, carlot, packed, 2" x D plate (about ¼" thick) $1.15 per lb, ton lot $1.17, less ton lot $1.19. Delivered. Spot, add 5c.

## VANADIUM ALLOYS

**Ferrovanadium:** Open-hearth grade (V 50-55%, Si 8% max, C 3% max). Contract, any quantity, $3.20 per lb of contained V. Delivered. Spot, add 10c. **Special Grade:** (V 50-55% or 70-75%, Si 2% max, C 0.5% max) $3.30. **High Speed Grade:** (V 50-55% or 70-75%, Si 1.50% max, C 0.20% max) $3.40.

**Grainal:** Vanadium Grainal No. 1 $1.05 per lb; No. 79, 50c, freight allowed.

**Vanadium Oxide:** Contract, less carload lot, packed, $1.38 per lb contained $V_2O_5$, freight allowed. Spot, add 5c.

## SILICON ALLOYS

**50% Ferrosilicon:** Carload, lump, bulk, 14.6c per lb contained Si. Packed, c.l. 17.1c, ton lot 18.55c, less ton 20.20c, f.o.b. Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Portland, Oreg. Spot, add 0.45c.

**Low-Aluminum 50% Ferrosilicon:** (Al 0.40% max). Add 1.45c to 50% ferrosilicon prices.

**65% Ferrosilicon:** Carload, lump, bulk, 15.75c per lb contained silicon. Packed, c.l. 17.75c, ton lot 19.55c, less ton 20.9c. Delivered. Spot, add 0.35c.

**75% Ferrosilicon:** Carload, lump, bulk, 16.9c per lb of contained Si. Packed, c.l. 18.8c, ton lot 20.45c, less ton 21.7c. Delivered. Spot, add 0.3c.

**90% Ferrosilicon:** Carload, lump, bulk, 20c per lb of contained Si. Packed, c.l. 21.65c, ton lot 23.05c, less ton 24.1c. Delivered. Spot, add 0.25c.

**Silicon Metal:** (98% min Si, 1.00% max Fe, 0.07% max Ca). C.l. lump, bulk, 21.5c per lb of Si. Packed, c.l. 23.15c, ton lot 24.45c, less ton 25.45c. Add 0.5c for max 0.03% Ca grade. Add 0.5c for 0.50% Fe grade analyzing 98.25% min Si.

**Alsifer:** (Approx 20% Al, 40% Si, 40% Fe). Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 9.85c per lb of alloy; ton lot, packed, 10.85c.

## ZIRCONIUM ALLOYS

**12-15% Zirconium Alloy:** (Zr 12-15%, Si 39-43%, C 0.20% max). Contract, c.l. lump, bulk, 9.25c per lb of alloy. Packed, c.l. 10.45c, ton lot 11.6c, less ton 12.45c. Delivered. Spot, add 0.25c.

**35-40% Zirconium Alloy:** (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max). Carload bulk 26.25c per lb of alloy, carload, lump, packed 27.25c, ton lot 28.4c, less ton 29.65c. Freight allowed. Spot, add 0.25c.

## BORON ALLOYS

**Ferroboron:** 100 lb or more packed (B 17.50% min, Si 1.50% max, Al 0.50% max, C 0.50% max). Contract, 100 lb or more 1" x D, $1.20 per lb of alloy; less than 100 lb $1.30. Delivered. Spot, add 5c. F.o.b. Washington, Pa., prices, 100 lb and over are as follows: Grade A (10-14% B) 85c per lb; Grade B (14-18% B) $1.20; Grade C (19% min B) $1.50.

**Borosil:** (3 to 4% B, 40 to 45% Si). Carload, bulk, lump, or 3" x D, $5.25 per lb of contained B. Packed, carload $5.40, ton to c.l. $5.50, less ton $5.60. Delivered.

**Carbortam:** (B 1 to 2%). Lump, carload $320 per ton, f.o.b. Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

## CALCIUM ALLOYS

**Calcium-Manganese-Silicon:** (Ca 16-20%, Mn 14-18% and Si 53-59%). Carload, lump, bulk 23c per lb of alloy, carload packed 24.25c, ton lot 26.15c, less ton 27.15c. Delivered. Spot, add 0.25c.

**Calcium-Silicon:** (Ca 30-33%, Si 60-65%, Fe 1.5-3%). Carload, lump, bulk 24c per lb of alloy, carload packed 25.65c, ton lot 27.95c, less ton 29.45c. Delivered. Spot, add 0.25c.

## BRIQUETTED ALLOYS

**Chromium Briquets:** (Weighing approx 3¾ lb each and containing 2 lb of Cr). Carload, bulk 19.60c per lb of briquet, in bags 20.70c; 3000 lb to c.l. pallets 20.80c; 2000 lb to c.l. in bags 21.90c; less than 2000 lb in bags 22.80c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

**Ferromanganese Briquets:** (Weighing approx 3 lb and containing 2 lb of Mn). Carload, bulk 14.8c per lb of briquet; c.l., packed, bags 16c; 3000 lb to c.l., pallets 16c; 2000 lb to c.l., bags 17.2c; less ton 18.1c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

**Silicomanganese Briquets:** (Weighing approx 3½ lb and containing 2 lb of Mn and approx ½ lb of Si). C.l. bulk 15.1c per lb of briquet; c.l. packed, bags 16.3c, 3000 lb to c.l., pallets 16.3c; 2000 lb to c.l., bags 17.5c; less ton 18.4c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

**Silicon Briquets:** (Large size—weighing approx 5 lb and containing 2 lb of Si and small sizes, weighing approx 2½ lb and containing 1 lb of Si). Carload, bulk 8c per lb or briquet; packed, bags 9.2c; 3000 lb to c.l., pallets 9.6c; 2000 lb to c.l.; bags 10.8c; less ton 11.7c. Delivered. Spot, add 0.25c.

**Molybdic-Oxide Briquets:** (Containing 2½ lb of Mo each). $1.49 per lb of Mo contained, f.o.b. Langeloth, Pa.

**Titanium Briquets:** Ti 98.27%, $1 per lb, f.o.b. Niagara Falls, N. Y.

## TUNGSTEN ALLOYS

**Ferrotungsten:** (70-80%). 5000 lb W or more $2.15 per lb (nominal) of contained W. Delivered.

## OTHER FERROALLOYS

**Ferrocolumbium:** (Cb 50-60%, Si 8% max, C 0.1% max). Ton lots 2" x D, $3.45 per lb of contained Cb; less ton lots $3.50 (nominal). Delivered.

**Ferrotantalum Columbium:** (Cb 40% approx, Ta 20% approx, and Cb plus Ta 60% min, C 0.30% max). Ton lots 2" x D, $3.05 per lb of contained Cb plus Ta, delivered; less ton lots $3.10.

**SMZ Alloy:** (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx). Carlot bulk 19.25c per lb of alloy, c.l. packed ½ in. x 12 M 20.00c, ton lot 21.15c, less ton 22.40c. Delivered. Spot, add 0.25c.

**Graphidox No. 4:** (Si 48-52%, Ca 5-7%, Ti 9-11%). C.l. packed, 20c per lb of alloy, ton lot 21.15c; less ton lot 22.4c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

**V-3 Foundry Alloy:** (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l. packed 18.45c per lb of alloy; ton lot 19.95c; less ton lot 21.20c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

**Simanal:** (Approx 20% each Si, Mn, Al; bal Fe). Lump, carload, bulk 19.25c. Packed c.l. 20.25c, 2000 lb to c.l. 21.25c; less than 2000 lb 21.75c per lb of alloy. Delivered.

**Ferrophosphorus:** (23-25% based on 24% P content with unitage of $5 for each 1% of P above or below the base). Carload, bulk, f.o.b. sellers' works, Mt. Pleasant, Siglo, Tenn., $120 per gross ton.

**Ferromolybdenum:** (55-75%). Per lb of contained Mo in 200-lb container, f.o.b. Langeloth and Washington, Pa., $1.76 in all sizes except powdered which is $1.82.

**Technical Molybdic-Oxide:** Per lb of contained Mo., in cans, $1.47; in bags, $1.46, f.o.b. Langeloth and Washington, Pa.

# SEE HOW TENSILES OF SPECIAL HB COMPARE WITH MUSIC WIRE

| SIZE | STANDARD HB | *SPECIAL* HB | MUSIC WIRE |
|---|---|---|---|
| .1620 | 219,000 min. | **249,000 min.** | 249,000 min. |
| .1350 | 227,000 " | **258,000 "** | 258,000 " |
| .0800 | 244,000 " | **276,000 "** | 282,000 " |
| .0200 | 310,000 " | **320,000 "** | 350,000 " |

## —at savings of up to 60%

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# PAGE —the source for answers to wire problems

# Scrap Composite Rises Slightly

**STEEL's index on No. 1 heavy melting goes up another 50 cents a ton to $35.50, highest since early April. Advance scored in face of spotty demand and threatened steel strike**

Scrap Prices, Page 204

• **Pittsburgh**—The market's in its usual midmonth lull, but prices are firm. Dealers are moderately bullish because bids on industrial scrap and railroad lists were about $3 higher than they were a month ago. Some brokers believe No. 1 heavy melting scrap is worth $40 a ton, but they admit that the price can't be substantiated. Small tonnages are moving at $36.

• **Philadelphia**—Except for an increase in short shoveling turnings to $23-$24, delivered, scrap prices are unchanged. Domestic demand is easier, and some steel mills have named June 20 as the cutoff date on incoming shipments should the threat of a strike continue. Export demand tends to bolster the market.

• **New York**—Following an increase on some steel grades a week ago, the market is now unchanged throughout the list. Brokers have enough tonnage under contract to meet current export commitments and are under less pressure from domestic buyers.

Steadiness prevails in the major steel grades and in cast scrap and stainless specialties.

• **Chicago**—The market continues to carry a stronger tone, but lack of buying by the mills tends to offset it. It's reported that No. 1 dealer heavy melting steel sold for $35, No. 1 dealer bundles for $36 —up $1 a ton, but the transactions may not be representative.

Little new buying can be expected the remainder of this month, or until it is known if there'll be a strike. Some mills have already announced no scrap shipments will be accepted after June 20.

The cast iron grades are in good demand because the gray iron foundries are busier, and prices are up $1 a ton.

• **Cleveland** — There's not much change in the market. Practically no buying of consequence is expected until after the steel labor negotiations are out of the way. Some steel plants have set June 15 as the deadline for shipping scrap on old orders. They don't want to have to pay demurrage on unloaded freight cars if there is a strike. Some turnings tonnage has been moving to blast furnaces in the Valley.

• **Detroit**—The market is quiet. A Canadian order for specially cut bundles is still unfilled. Chrysler reportedly offered one of the local mills 5000 to 6000 tons of No. 1 bundles for $41 and was turned down. Dealers are split on where the market will go, but the feeling is growing stronger that the end of the month will show a drop in

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Gives narrower, smoother cuts on industry's toughest materials

**...yet prices start at only $32.25**

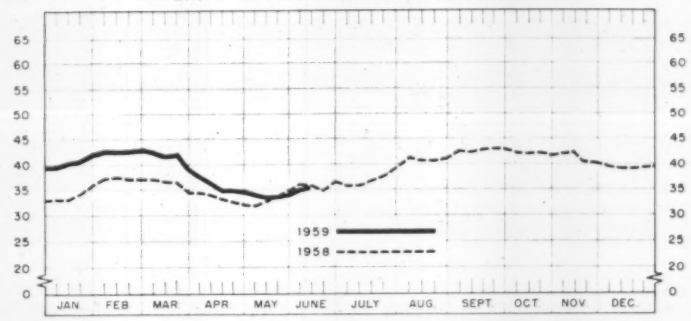
Now... at *production prices*... DIATRONIC gives you a rim width of .006" that's accurate to a maximum total tolerance of .0005"—or your money back. This accuracy is built in by a new process. No break-in needed. New narrow cut reduces sawdust loss 30%. A must for $3,000-a-pound silicon or germanium crystal. Cuts tungsten carbide, corundum, aluminum oxide, glass... practically anything. Stock orders shipped in hours; special wheels available. Write for literature, price list.

*Another invention marketed by*
**NAVAN PRODUCTS, INC.**
Subsidiary of North American Aviation, Inc.
**Dept. 112, International Airport, Los Angeles 45, Cal.**

**DIATRONIC* DIAMOND WHEELS**
"with built-in tolerance" *TRADEMARK

## STEELMAKING SCRAP PRICE COMPOSITE

Based on No. 1 heavy melting grade at Pittsburgh, Chicago, and eastern Pennsylvania—Compiled by STEEL.




| June 10 1959 | Week Ago | Month Ago | Year Ago | May Avg. |
|---|---|---|---|---|
| $35.50 | $35.00 | $33.33 | $35.67 | $33.58 |

prices. It seems unlikely that the mills will buy on the eve of a possible strike.

Foundry steel looks like it may be in for a slight tumble. Local foundries were expecting June 1 releases on 1961 auto parts, but they have been held up.

• **Buffalo**—Leading grades of steel scrap are $2 a ton higher as the result of new mill purchases. No. 1 heavy melting is quoted $33-$34 and No. 2 heavy melting $28-$29. Turnings are up $1.

Railroad scrap, low phos, and other specialties are up $2 in sympathy with the rise on the open hearth grades. Cast iron scrap prices remain unchanged.

Dealers attribute the stronger market to a desire by the mills to keep scrap coming into their plants at a steady pace during early June. It's expected the mills will start cutting off deliveries around June 20 if a strike is imminent.

• **Cincinnati** — Scrap is stronger, mainly on broker and dealer sentiment. No. 1 heavy melting is up $1 a ton in broker buying prices to $33.50-$34.50. Increases of $1 to $2 a ton are spotted throughout the lists, with some increases representing broker advances to cover old orders, and overcome dealer resistance.

• **St. Louis**—Scrap prices continue firm. Mills are a little cagey about buying, but seem interested in getting in more scrap. The market may stiffen further and prices show some rise before month's end.

• **Birmingham** — The market is stronger. Dealers are accepting orders at prices that are $1 to $2 a ton higher. A railroad list closed last week $1 to $3 a ton higher on most items. With pressure pipe manufacture rising, the cast scrap market is firm. Brokers say cast prices would be higher were it not for an influx of foreign pig iron, which is being offered at $15 to $20 a ton under domestic prices.

• **Houston**—The supply of country scrap is critically low. Brokers are having difficulty covering Mexican orders and buying for export.

Current orders for both Texas mills expire June 15. The producer at Houston is out of the market until after the steel wage issue is settled. The second Texas mill is reported interested in purchasing additional tonnage at the old price level.

Most Texas foundries hold comfortable inventories, but cast scrap prices are supported by light supplies.

• **San Francisco**—There isn't much scrap moving to the steel mills, but the market is firm at prevailing prices.

• **Seattle** — The market is at a standstill. Large buyers are preparing for mill closedowns at the end of the month, and have notified scrapyards to hold up shipments after June 24. Production and consumption of scrap are down. A strike in the metal trades reduced the scrap turnover by more than 1000 tons last month. Foreign buyers are holding back purchases, awaiting market developments favorable to them in event the domestic steel plants are closed by a strike.

• **Los Angeles**—Because mills will not accept tonnage shipments after June 15, the steel grades are inactive. Prices are steady despite sluggish demand.

## Rails, Cars . . .

Track Material Prices, Page 196

If there is a steel strike, freight carbuilders will likely be caught short of supplies first. The railroads placed car orders too late for them to bolster their inventories of light plates and standard shapes. They have had to put incoming shipments into production.

The carriers have been buying more rails this year than last, but the total volume isn't impressive. It's likely the roads will get enough tonnage this year to satisfy their tracklaying programs.

## STRUCTURAL SHAPES . . .

### STRUCTURAL STEEL PLACED

4200 tons, three plants, Bestwall Gypsum Co., Ardmore, Pa., to Mississippi Valley Structural Steel Co., St. Louis; each plant will require 1400 tons, with locations to be announced later.

1174 tons, section of Bruckner Expressway, New York, to Harris Structural Steel Co., New York.

700 tons, New York State bridgework, Syracuse, N. Y., to Harris Structural Steel Co., New York.

320 tons, manufacturing plant, National Gypsum Co., Savannah, Ga., to Steel Products Inc., Savannah; Dan'el Construction Co., Birmingham, general contractor.

300 tons, two dormitories, Pembroke College, Brown University, Providence, R. I., to A. O. Wilson Structural Co., Cambridge, Mass.; J. L. Marshall & Sons Inc., Pawtucket, R. I., general contractor; concrete reinforcing bars to Bethlehem Steel Co., Bethlehem, Pa.

240 tons, Garden State Plaza, R. H. Macy, Paramus, N. J., to Elizabeth Iron Works, Union, N. J.

140 tons, high school, Wayland, Mass., to Groisser & Shlager Iron Works, Somerville, Mass.; N.D.C. Construction Co., Boston, general contractor.

### STRUCTURAL STEEL PENDING

7000 tons, transmission towers, to link Niagara and St. Lawrence power projects, New York State Power Authority; Societa Anonima Electrificazione, Milan, Italy, is low with bid of $1,371,451 vs. $2,166,048 by Bethle-

(Please turn to Page 209)

# Iron and Steel Scrap

Consumer prices per gross ton, except as otherwise noted, including brokers' commission, as reported to STEEL, June 10, 1959. *Changes shown in italics.*

## STEELMAKING SCRAP COMPOSITE

| | |
|---|---|
| June 10 | $35.50 |
| June 3 | 35.00 |
| May Avg. | 33.58 |
| June 1958 | 35.50 |
| June 1954 | 27.92 |

Based on No. 1 heavy melting grade at Pittsburgh, Chicago, and eastern Pennsylvania.

### PITTSBURGH

| | |
|---|---|
| *No. 1 heavy melting* | *35.00-36.00* |
| *No. 2 heavy melting* | *31.00-32.00* |
| No. 1 dealer bundles | 38.00-39.00 |
| No. 2 bundles | 25.00-26.00 |
| No. 1 busheling | 38.00-39.00 |
| No. 1 factory bundles | 44.00-45.00 |
| Machine shop turnings | 19.00-20.00 |
| Mixed borings, turnings | 19.00-20.00 |
| Short shovel turnings | 24.00-25.00 |
| Cast iron borings | 24.00-25.00 |
| Cut structurals: | |
| 2 ft and under | 43.00-44.00 |
| 3 ft lengths | 42.00-43.00 |
| Heavy turnings | 30.00-31.00 |
| Punchings & plate scrap | 45.00-46.00 |
| Electric furnace bundles | 42.00-43.00 |

Cast Iron Grades

| | |
|---|---|
| No. 1 cupola | 45.00-46.00 |
| Stove plate | 45.00-46.00 |
| Unstripped motor blocks | 32.00-33.00 |
| Clean auto cast | 46.00-47.00 |
| Drop broken machinery | 51.00-52.00 |

Railroad Scrap

| | |
|---|---|
| *No. 1 R.R. heavy melt.* | *44.00-45.00* |
| *Rails, 2 ft and under* | *57.00-58.00* |
| *Rails, 18 in. and under* | *57.00-58.00* |
| *Random rails* | *51.00-52.00* |
| *Angles, splice bars* | *50.00-51.00* |
| *Railroad specialties* | *50.00-51.00* |
| Rails, rerolling | 61.00-62.00 |

Stainless Steel Scrap

| | |
|---|---|
| 18-8 bundles & solids | 220.00-225.00 |
| 18-8 turnings | 115.00-120.00 |
| 430 bundles & solids | 120.00-125.00 |
| 430 turnings | 55.00-65.00 |

### CHICAGO

| | |
|---|---|
| No. 1 hvy melt., indus. | 35.00-36.00 |
| *No. 1 hvy melt., dealer* | *34.00-35.00* |
| No. 2 heavy melting | 31.00-32.00 |
| No. 1 factory bundles | 41.00-42.00 |
| *No. 1 dealer bundles* | *35.00-36.00* |
| No. 2 bundles | 24.00-25.00 |
| No. 1 busheling, indus. | 35.00-36.00 |
| No. 1 busheling, dealer | 33.00-34.00 |
| Machine shop turnings | 17.00-18.00 |
| Mixed borings, turnings | 19.00-20.00 |
| Short shovel turnings | 19.00-20.00 |
| Cast iron borings | 19.00-20.00 |
| Cut structurals, 3 ft | 43.00-44.00 |
| Punchings & plate scrap | 44.00-45.00 |

Cast Iron Grades

| | |
|---|---|
| *No. 1 cupola* | *50.00-51.00* |
| *Stove plate* | *47.00-48.00* |
| *Unstripped motor blocks* | *42.00-43.00* |
| *Cleaning auto cast* | *57.00-58.00* |
| *Drop broken machinery* | *57.00-58.00* |

Railroad Scrap

| | |
|---|---|
| No. 1 R.R. heavy melt. | 39.00-40.00 |
| R.R. malleable | 59.00-60.00 |
| Rails, 2 ft and under | 55.00-56.00 |
| Rails, 18 in. and under | 56.00-57.00 |
| Angles, splice bars | 48.00-49.00 |
| Axles | 65.00-66.00 |
| Rails, rerolling | 58.00-59.00 |

Stainless Steel Scrap

| | |
|---|---|
| 18-8 bundles & solids | 215.00-220.00 |
| 18-8 turnings | 115.00-120.00 |
| 430 bundles & solids | 115.00-120.00 |
| 430 turnings | 55.00-60.00 |

### YOUNGSTOWN

| | |
|---|---|
| No. 1 heavy melting | 39.00-40.00 |
| No. 2 heavy melting | 28.00-29.00 |
| No. 1 busheling | 39.00-40.00 |
| No. 1 bundles | 39.00-40.00 |
| No. 2 bundles | 25.00-26.00 |
| Machine shop turnings | 17.00-18.00 |
| Short shovel turnings | 22.00-23.00 |
| Cast iron borings | 22.00-23.00 |
| Low phos. | 42.00-43.00 |
| Electric furnace bundles | 42.00-43.00 |

Railroad Scrap

| | |
|---|---|
| No. 1 R.R. heavy melt. | 38.00-39.00 |

### CLEVELAND

| | |
|---|---|
| No. 1 heavy melting | 36.00-37.00 |
| No. 2 heavy melting | 25.00-26.00 |
| No. 1 factory bundles | 41.00-42.00 |
| No. 1 bundles | 36.00-37.00 |
| No. 2 bundles | 25.00-26.00 |
| No. 1 busheling | 36.00-37.00 |
| Machine shop turnings | 14.00-15.00 |
| Short shovel turnings | 20.00-21.00 |
| Mixed borings, turnings | 20.00-21.00 |
| Cast iron borings | 20.00-21.00 |
| Cut foundry steel | 39.00-40.00 |
| Cut structurals, plates 2 ft and under | 43.00-44.00 |
| Low phos. punchings & plate | 39.00-40.00 |
| Alloy free, short shovel turnings | 22.00-23.00 |
| Electric furnace bundles | 39.00-40.00 |

Cast Iron Grades

| | |
|---|---|
| No. 1 cupola | 47.00-48.00 |
| Charging box cast | 38.00-39.00 |
| Heavy breakable cast | 38.00-39.00 |
| Stove plate | 44.00-45.00 |
| Unstripped motor blocks | 33.00-34.00 |
| Brake shoes | 36.00-37.00 |
| Clean auto cast | 50.00-51.00 |
| Burnt cast | 37.00-38.00 |
| Drop broken machinery | 50.00-51.00 |

Railroad Scrap

| | |
|---|---|
| R.R. malleable | 65.00-66.00 |
| Rails, 2 ft and under | 57.00-58.00 |
| Rails, 18 in. and under | 58.00-59.00 |
| Rails, random lengths | 52.00-53.00 |
| Cast steel | 46.00-47.00 |
| Railroad specialties | 48.00-49.00 |
| Uncut tires | 42.00-43.00 |
| Angles, splice bars | 51.00-52.00 |
| Rails, rerolling | 58.00-59.00 |

Stainless Steel

(Brokers' buying prices; f.o.b. shipping point)

| | |
|---|---|
| 18-8 bundles, solids | 215.00-220.00 |
| 18-8 turnings | 110.00-115.00 |
| 430 clips, bundles, solids | 125.00-130.00 |
| 430 turnings | 45.00-55.00 |

### ST. LOUIS

(Brokers' buying prices)

| | |
|---|---|
| No. 1 heavy melting | 33.00 |
| No. 2 heavy melting | 31.00 |
| No. 1 bundles | 37.00 |
| No. 2 bundles | 21.00 |
| No. 1 busheling | 37.00 |
| Machine shop turnings | 14.00 |
| Short shovel turnings | 16.00 |

Cast Iron Grades

| | |
|---|---|
| No. 1 cupola | 50.00 |
| Charging box cast | 42.00 |
| Heavy breakable cast | 40.00 |
| Unstripped motor blocks | 41.00 |
| Clean auto cast | 51.00 |
| Stove plate | 46.00 |

Railroad Scrap

| | |
|---|---|
| *No. 1 R.R. heavy melt.* | *38.00* |
| Rails, 18 in. and under | 49.00 |
| Rails, random lengths | 42.50 |
| *Rails, rerolling* | *54.50* |
| Angles, splice bars | 45.00 |

### BIRMINGHAM

| | |
|---|---|
| *No. 1 heavy melting* | *30.00-31.00* |
| *No. 2 heavy melting* | *24.00-25.00* |
| *No. 1 bundles* | *30.00-31.00* |
| No. 2 bundles | 21.00-22.00 |
| *No. 1 busheling* | *30.00-31.00* |
| Cast iron borings | 14.00-15.00 |
| Machine shop turnings | 22.00-23.00 |
| Short shovel turnings | 24.00-25.00 |
| *Bar crops and plates* | *42.00-43.00* |
| *Structurals & plates* | *41.00-42.00* |
| Electric furnace bundles | 36.00-37.00 |
| Electric furnace: | |
| 3 ft and under | 34.00-35.00 |
| 2 ft and under | 35.00-36.00 |

Cast Iron Grades

| | |
|---|---|
| No. 1 cupola | 53.00-54.00 |
| Stove plate | 53.00-54.00 |
| Charging box cast | 29.00-30.00 |
| Unstripped motor blocks | 40.00-41.00 |
| *No. 1 wheels* | *40.00-41.00* |

Railroad Scrap

| | |
|---|---|
| *No. 1 R.R. heavy melt.* | *34.00-35.00* |
| *Rails, 18 in. and under* | *45.00-46.00* |
| Rails, rerolling | 52.00-53.00† |
| *Rails, random lengths* | *40.00-41.00* |
| *Angles, splice bars* | *43.00-44.00* |

### PHILADELHIA

| | |
|---|---|
| No. 1 heavy melting | 36.00† |
| No. 2 heavy melting | 30.00 |
| No. 1 bundles | 38.00 |
| No. 2 bundles | 23.00 |
| No. 1 busheling | 37.00 |
| Electric furnace bundles | 39.00 |
| Mixed borings, turnings | 20.00† |
| *Short shovel turnings* | *23.00-24.00* |
| Machine shop turnings | 20.00 |
| Heavy turnings | 32.00-33.00 |
| Structurals & plate | 40.00-42.00 |
| Couplers, springs, wheels | 42.00-43.00 |
| Rail crops, 2 ft & under | 58.00-60.00 |

Cast Iron Grades

| | |
|---|---|
| No. 1 cupola | 41.00 |
| Heavy breakable cast | 42.00 |
| Drop broken machinery | 49.00-50.00 |
| Malleable | 67.00-68.00 |

### NEW YORK

(Brokers' buying prices)

| | |
|---|---|
| No. 1 heavy melting | 28.00-29.00 |
| No. 2 heavy melting | 25.00-26.00 |
| No. 1 bundles | 28.00-29.00 |
| No. 2 bundles | 16.00-17.00 |
| Machine shop turnings | 9.00-10.00† |
| Mixed borings, turnings | 12.00-13.00 |
| Short shovel turnings | 13.00-14.00 |
| Low phos. (structurals & plates) | 36.00-37.00 |

Cast Iron Grades

| | |
|---|---|
| No. 1 cupola | 36.00-37.00 |
| Unstripped motor blocks | 24.00-25.00 |
| Heavy breakable | 34.00-35.00 |

Stainless Steel

| | |
|---|---|
| 18-8 sheets, clips, solids | 195.00-200.00 |
| 18-8 borings, turnings | $5.00-90.00 |
| 410 sheets, clips, solids | 55.00-60.00 |
| 430 sheets, clips, solids | $5.00-90.00 |

### BUFFALO

| | |
|---|---|
| No. 1 heavy melting | 33.00-34.00 |
| No. 2 heavy melting | 28.00-29.00 |
| No. 1 bundles | 33.00-34.00 |
| No. 2 bundles | 23.00-24.00 |
| No. 1 busheling | 33.00-34.00 |
| Short shovel turnings | 21.00-22.00 |
| Machine shop turnings | 17.00-18.00 |
| Short shovel turnings | 21.00-22.00 |
| Cast iron borings | 19.00-20.00 |
| Low phos structurals and plate, 2 ft and under | 43.00-44.00 |

Cast Iron Grades

(F.o.b. shipping point)

| | |
|---|---|
| No. 1 cupola | 44.00-45.00 |
| No. 1 machinery | 48.00-49.00 |

Railroad Scrap

| | |
|---|---|
| Rails, random lengths | 45.00-46.00 |
| Rails, 3 ft and under | 51.00-52.00 |
| Railroad specialties | 43.00-44.00 |

### CINCINNATI

(Brokers' buying prices; f.o.b. shipping point)

| | |
|---|---|
| *No. 1 heavy melting* | *33.50-34.50* |
| *No. 2 heavy melting* | *28.50-29.50* |
| *No. 1 bundles* | *33.50-34.50* |
| No. 2 bundles | 23.00-24.00 |
| *No. 1 busheling* | *33.50-34.50* |
| *Machine shop turnings* | *17.00-18.00* |
| *Mixed borings, turnings* | *17.00-18.00* |
| *Short shovel turnings* | *19.00-20.00* |
| *Cast iron borings* | *18.00-19.00* |
| *Low phos., 18 in.* | *43.00-44.00* |

Cast Iron Grades

| | |
|---|---|
| No. 1 cupola | 45.00-46.00 |
| *Heavy breakable cast* | *40.00-41.00* |
| *Charging box cast* | *39.00-40.00* |
| *Drop broken machinery* | *50.00-51.00* |

Railroad Scrap

| | |
|---|---|
| *No. 1 R.R. heavy melt.* | *38.00-39.00* |
| *Rails, 18 in. and under* | *55.00-56.00* |
| Rails, random lengths | 47.00-48.00 |

### HOUSTON

(Brokers' buying prices; f.o.b. cars)

| | |
|---|---|
| No. 1 heavy melting | 34.00 |
| No. 2 heavy melting | 31.00 |
| No. 1 bundles | 34.00 |
| *No. 2 bundles* | *21.00* |
| Machine shop turnings | 17.00 |
| Short shovel turnings | 20.00 |
| Low phos. plates & structurals | 41.00 |

Cast Iron Grades

| | |
|---|---|
| *No. 1 cupola* | *45.00-46.00* |
| Heavy breakable | 27.00-28.00† |
| *Foundry malleable* | *41.00-42.00* |
| *Unstripped motor blocks* | *38.00-38.50* |

Railroad Scrap

| | |
|---|---|
| No. 1 R.R. heavy melt. | 34.00 |

### BOSTON

(Brokers' buying prices; f.o.b. shipping point)

| | |
|---|---|
| *No. 1 heavy melting* | *26.00* |
| No. 2 heavy melting | 20.00-20.50 |
| *No. 1 bundles* | *26.00* |
| *No. 1 busheling* | *26.00* |
| Machine shop turnings | 8.00-9.00 |
| *Short shovel turnings* | *11.00-12.00* |
| No. 1 cast | 33.00 |
| Mixed cupola cast | 33.00 |
| No. 1 machinery cast | 34.00 |

### DETROIT

(Brokers' buying prices; f.o.b. shipping point)

| | |
|---|---|
| No. 1 heavy melting | 31.00-32.00 |
| No. 2 heavy melting | 20.00-21.00 |
| No. 1 bundles | 33.00-34.00 |
| No. 2 bundles | 19.00-20.00 |
| No. 1 busheling | 31.00-32.00 |
| Machine shop turnings | 12.00-13.00 |
| Mixed borings, turnings | 13.00-14.00 |
| Short shovel turnings | 13.00-14.00 |

Cast Iron Grades

| | |
|---|---|
| No. 1 cupola | 46.00-47.00 |
| Stove plate | 35.00-36.00 |
| Charging box cast | 36.00-37.00 |
| Heavy breakable | 36.00-37.00 |
| Unstripped motor blocks | 24.00-25.00 |
| Clean auto cast | 50.00-51.00 |

### SEATTLE

| | |
|---|---|
| No. 1 heavy melting | 35.00 |
| No. 2 heavy melting | 33.00 |
| No. 1 bundles | 27.00† |
| No. 2 bundles | 22.00 |
| Machine shop turnings | 17.00 |
| Mixed borings, turnings | 17.00 |
| Electric furnace No. 1 | 38.00† |

Cast Iron Grades

| | |
|---|---|
| No. 1 cupola | 34.00 |
| Heavy breakable cast | 28.00† |
| Unstripped motor blocks | 26.00 |
| Stove plate (f.o.b. plant) | 21.00† |

### LOS ANGELES

| | |
|---|---|
| No. 1 heavy melting | 38.00 |
| No. 2 heavy melting | 36.00 |
| No. 1 bundles | 35.00 |
| No. 2 bundles | 18.00 |
| Machine shop turnings | 17.00 |
| Shoveling turnings | 19.00 |
| Cast iron borings | 19.00 |
| Cut structurals and plate 1 ft and under | 49.00 |

Cast Iron Grades

(F.o.b. shipping point)

| | |
|---|---|
| No. 1 cupola | 47.00 |

Railroad Scrap

| | |
|---|---|
| No. 1 R.R. heavy melt. | 41.00 |

### SAN FRANCISCO

| | |
|---|---|
| No. 1 heavy melting | 36.00 |
| No. 2 heavy melting | 33.00 |
| No. 1 bundles | 33.00 |
| No. 2 bundles | 22.00 |
| Machine shop turnings | 16.00 |
| Mixed borings, turnings | 16.00 |
| Cast iron borings | 16.00 |
| Heavy turnings | 16.00 |
| Short shovel turnings | 16.00 |
| Cut structurals, 3 ft | 42.00 |

Cast Iron Grades

| | |
|---|---|
| No. 1 cupola | 44.00 |
| Charging box cast | 34.00 |
| Stove plate | 34.00 |
| Heavy breakable cast | 28.00 |
| Unstripped motor blocks | 31.00 |
| Clean auto cast | 40.00 |
| Drop broken machinery | 40.00 |
| No. 1 wheels | 34.00 |

### HAMILTON, ONT.

(Brokers' buying prices)

| | |
|---|---|
| No. 1 heavy melting | 32.25 |
| No. 2 heavy melting | 28.25 |
| No. 1 bundles | 32.25 |
| No. 2 bundles | 22.75 |
| Mixed steel scrap | 24.25 |
| Mixed borings, turnings | 13.00 |
| Busheling, new factory: Prepared | 32.25 |
| Unprepared | 26.25 |
| Short steel turnings | 17.00 |

Cast Iron Grades‡

| | |
|---|---|
| No. 1 machinery cast | 46.50-48.00 |

†Nominal.
‡F.o.b. Hamilton, Ont.

# THE U.S. TREASURY SALUTES THE PEOPLE IN THE STEEL INDUSTRY

## —who buy Savings Bonds and strengthen America's Peace Power

Men and women who earn their living in the steel industry can take great pride in knowing that their crafts and skills contribute, through raw material supplies, to nearly every other great industry in the United States. They can also be proud of the help thousands upon thousands of them are giving to America's Peace Power through the purchase of U.S. Savings Bonds.

Through regular purchase of Shares in America, these thrift-conscious people are reinforcing their own security after retirement, and establishing current reserves for such worthwhile family projects as new homes, education and travel.

If your company has not put in a Payroll Savings Plan thus far, you can start immediately. Just telephone your State Savings Bonds Director and accept the help he wants to give you. Or write to Savings Bonds Division, U.S. Treasury Department, Washington, D.C.

**J. K. Thomson** is shown here at his work in one of the great steel mills of this country. Like thousands of his fellow craftsmen, Mr. Thomson is making regular use of his company Payroll Savings Plan to contribute to the Peace Power of his country.

STEEL
The Metalworking Weekly

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# Mills Cite Import Perils

**Brass mill industry calls for tariff help to stop flood of foreign products. Aluminum industry changes shipping policy. April zinc sales zoom. Tantalum price chopped**

Nonferrous Metal Prices, Pages 208 & 209

THE DOMESTIC BRASS mill industry has declined since World War II due to U. S. international economic policies, says the Copper & Brass Association.

CABRA reports:

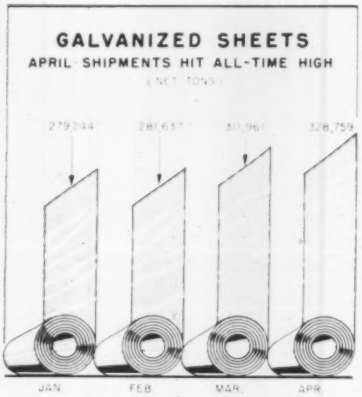
- An "alarming" growth in brass mill imports. (The loss in some markets, such as tubular plumbing goods, is almost 100 per cent.)
- The conversion of the U. S. from a net exporter to a net importer of brass mill products.
- The gradual displacement of U. S. brass mill labor with foreign labor which is paid only a fraction of our wage rates.

• **Documentation** — Domestic mill production fell from 3.6 billion lb in 1943 to 1.5 billion lb last year, even though capacity has increased greatly in the interim. Between 1949 and last year, imports rose from 21,085,000 lb to 153,948,000 lb. The increase in the ratio of imports to exports has been steady.

The foreign goods are mainly from Britain, West Germany, Canada, and Belgium, says CABRA. Two related factors explain their success in this country: Price and the disparity in wage rates. For example, in 1957 the average U. S. brass mill wage was $2.07 cents an hour compared with 62 cents in Britain, 55 cents in Germany, and $1.67 in Canada.

• **More Woes**—Substitution is also a problem. Metalmen say more than 80 end use products have been replaced or are threatened. They mention screw machine products, bus bars, auto radiators, heat exchanger tubing, and refrigeration tubing. Result: Per capita brass mill shipments have slumped.

The industry thinks expanded research and promotional programs will take care of the substitution problem. For imports, CABRA suggests: "A flexible tariff which would merely equalize the wage disparity between foreign and domestic producers," and a government policy that would "encourage foreign producers to raise the level of their wages to more nearly that of our own."



Source: American Iron & Steel Institute

## Zinc Sales Gain

Heavy demand from galvanizers and automakers keeps the zinc market booming. Zincmen from New York to San Francisco wore smiles last week as they read the American Zinc Institute's figures for May. They showed slab zinc shipments were up 7000 tons (to 85,348 tons), the best showing since last October; producers' stocks were down over 7000 tons (to 196,004 tons), the lowest since January; and production was about even with April's.

## Tantalum Price Cut

The price of tantalum has been chopped almost in half. Union Carbide Metals Co. posts a new price of $35 a pound for high purity tantalum melting stock compared with the former quotation of $60. Increased demand, paced by expanded production facilities, is the reason behind the drop.

## Change Shipping Rules

The aluminum industry has made another basic change in its marketing policy. Effective July 1, Kaiser Aluminum & Chemical Corp. and Reynolds Metals Co. will sell metal only on f.o.b. destination or customer custody terms.

Previously, it had been the industry's custom to sell pig, ingot, and mill products f.o.b. the plant, with full freight allowance to the destination. It had become common for some customers to call for their orders at the producing plant, which in certain cases amounted to price discounting.

Says Kaiser: "The allowance of freight in connection with pickup of materials at our plants has been abused by means of questionable trucking arrangements and other practices. These are becoming more common and frequently lead to inequities to those customers who do not or are unable to pick up at our plants."

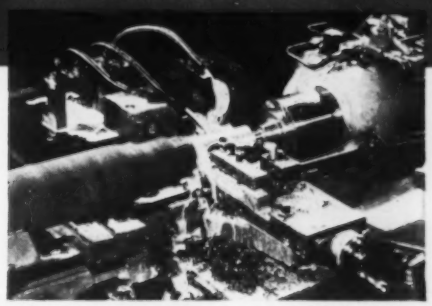
### NONFERROUS PRICE RECORD

| | June 10 Price | Last Change | Previous Price | May Avg | Apr. Avg | June, 1958 Avg |
|---|---|---|---|---|---|---|
| Aluminum | 24.70 | Aug. 1, 1958 | 24.00 | 24.700 | 24.700 | 24.000 |
| Copper | 31.50–32.00 | Apr. 30, 1959 | 31.50–32.50 | 31.750 | 32.404 | 25.400 |
| Lead | 11.80 | May 7, 1959 | 11.30 | 11.700 | 10.992 | 11.040 |
| Magnesium | 35.25 | Aug. 13, 1956 | 33.75 | 35.250 | 35.250 | 35.250 |
| Nickel | 74.00 | Dec. 6, 1956 | 64.50 | 74.000 | 74.000 | 74.000 |
| Tin | 104.75 | June 10, 1959 | 105.00 | 103.080 | 102.490 | 94.701 |
| Zinc | 11.00 | Feb. 25, 1959 | 11.50 | 11.000 | 11.000 | 10.000 |

Quotations in cents per pound based on: COPPER, mean of primary and secondary, deld. Conn. Valley; LEAD, common grade, deld. St. Louis; ZINC, prime western, E. St. Louis; TIN, Straits, deld. New York; NICKEL, electrolytic cathodes, 99.9%, base size at refinery, unpacked; ALUMINUM, primary pig, 99.5+%, f.o.b. shipping point; MAGNESIUM, pig 99.8%, Velasco, Tex.

# Don't Tool Up for Tomorrow's Boom with Yesterday's Lathes

## MONARCH'S HIGH PRODUCTION LATHES OF TOMORROW...



*Model 20-H Mona-Matic is available in 18", 30" and 42" center distance. Swing over bed is 15"; over front slide and rear slide ways, 8". Bed ways are flame hardened and ground.*

## 4..The New Model 20-H Mona-Matic—A Low First Cost Production Lathe

Take a good look at what we've done to the Mona-Matic concept of production turning. This new machine

(1) *Carries a low price tag, because of simplified design*

(2) *Has fast hydraulic feed and traverse movements, making it exceedingly productive*

(3) *Is a dependable day after day performer, requiring only routine maintenance for years of trouble-free service*

The Model 20-H is a fully automatic double carriage turning machine, with a 60° "Air-Gage Tracer" controlled front tool slide. A variety of automatic cycling arrangements provides high productiveness and versatility. Eight spindle speeds are available by pick-off gears in each of three standard ranges. The tailstock has an air actuated spindle and inbuilt, heavy duty, anti-friction center.

Front carriage feed rate is infinitely variable from 1" to 40" per minute; traverse is 200" per minute. Rear slide feed rate is ½" to 40" per minute while traverse is at 90" per minute.

Four different feeds are available to the carriage. Either a one or a two cut cycle can be furnished. Two cut cycle machines are provided with a selector switch for one or two cut operation.

Imagine better performance at lower cost these days! Why not let us set up a demonstration on your parts? *The Monarch Machine Tool Company*, Sidney, Ohio.

Monarch
TURNING MACHINES

IF IT CAN BE TURNED, THERE'S A MONARCH TO DO IT BETTER AND FASTER

# Nonferrous Metals

Cents per pound, carlots except as otherwise noted.

## PRIMARY METALS AND ALLOYS

**Aluminum:** 99.5%, pigs, 24.70; ingots, 26.80, 30,000 lb or more, f.o.b. shipping point. Freight allowed on 500 lb or more.

**Aluminum Alloy:** No. 13, 28.60; No. 43, 28.40; No. 195, 29.40; No. 214, 30.20; No. 356, 28.60; 30 or 40 lb ingots.

**Antimony:** R.M.M. brand, 99.5%, 29.00; Lone Star brand, 29.50, f.o.b. Laredo, Tex., in bulk. Foreign brands, 99.5%, 24.50-25.00, New York, duty paid, 10,000 lb or more.

**Beryllium:** 97% lump or beads, $71.50 per lb, f.o.b. Cleveland or Reading, Pa.

**Beryllium Aluminum:** 5% Be, $74.75 per lb of contained Be, with balance as Al at market price, f.o.b. shipping point.

**Beryllium Copper:** 3.75-4.75% Be, $43 per lb of contained Be, with balance as Cu at market price on shipment date, f.o.b. shipping point.

**Bismuth:** $2.25 per lb, ton lots.

**Cadmium:** Sticks and bars, $1.30 per lb deld.

**Cobalt:** 97.99%, $1.75 per lb for 500-lb keg, $1.77 per lb for 100 lb case; $1.82 per lb under 100 lb.

**Columbium:** Powder, $55-85 per lb, nom.

**Copper:** Electrolytic, 31.50 deld.; custom smelters, 32.00; lake, 31.50 deld.; fire refined, 31.25 deld.

**Germanium:** First reduction, less than 1 kg, 41.00 per gram; 1-10 kg, 37.00 per gram; intrinsic grade, 35.00-37.00 per gram.

**Gold:** U. S. Treasury, $35 per oz.

**Indium:** 99.9%, $2.25 per troy oz.

**Iridium:** $75-80 nom. per troy oz.

**Lead:** Common, 11.80; chemical, 11.90; corroding, 11.90, St. Louis, New York basis, add 0.20.

**Lithium:** 1 lb or 2 lb ingots, less than 100 lb, $11 per lb; 100-500 lb, $9.50 per lb; 500 lb or more, $9 per lb. All prices deld.

**Magnesium:** Pig, 35.25; ingot, 36.00 f.o.b. Velasco, Tex.; 12 in. sticks, 59.00 f.o.b. Madison, Ill.

**Magnesium Alloys:** AZ91A (diecasting), 40.75 deld.; AZ63A, AZ92A, AZ91C (sand casting), 40.75, f.o.b. Velasco, Tex.

**Mercury:** Open market, spot, New York, $241-243 per 76 lb flask.

**Molybdenum:** Unalloyed, turned extrusion, 3.75-5.75 in. round, $9.60 per lb in lots of 2500 lb or more, f.o.b. Detroit.

**Nickel:** Electrolytic cathodes, sheets (4 x 4 in. and larger), unpacked, 74.00; 10-lb pigs, unpacked, 78.25; "XX" nickel shot, 79.50; "F" nickel shot for addition to cast iron, 74.50; "F" nickel, 5 lb ingots in kegs for addition to cast iron, 75.50. Prices f.o.b. Port Colborne, Ont., including import duty. New York basis, add 1.01. Nickel oxide sinter at Buffalo, New York, or other established U. S. points of entry, contained nickel, 69.60.

**Osmium:** $70-100 per troy oz nom.

**Palladium:** $18-20 per troy oz.

**Platinum:** $77-80 per troy oz from refineries.

**Radium:** $16-21.50 per mg radium content, depending on quantity.

**Rhodium:** $122-125 per troy oz.

**Ruthenium:** $55-60 per troy oz.

**Selenium:** $7.00 per lb, commercial grade.

**Silver:** Open market, 91.375 per troy oz.

**Sodium:** Solid pack, c.l., 19.50; l.c.l., 20.00; brick, c.l., 21.00; l.c.l., 21.50; tank car, 17.00.

**Tantalum:** Melting stock, $35 per lb; rod, $60 per lb nom.; sheet, $55 per lb nom.

**Tellurium:** $2.00-2.20 per lb.

**Thallium:** $7.50 per lb.

**Tin:** Straits, N. Y., spot and prompt, 104.75.

**Titanium:** Sponge, 99.3 + % grade A-1, ductile (0.3% Fe max.), $1.62-1.82; grade A-2 (0.5% Fe max.), $1.70 per lb.

**Tungsten:** Powder, 98.8%, carbon reduced, 1000-lb lots, $2.75-2.90 per lb nom., f.o.b. shipping point; less than 1000 lb, add 15.00; 99 + % hydrogen reduced, $3.30-3.80.

**Zinc:** Prime western, 11.00; brass special, 11.25; intermediate, 11.50, East St. Louis, freight allowed over 0.50 per lb, New York basis, add 0.50. High grade, 12.00; special high grade, 12.25 deld. Diecasting alloy ingot No. 3, 14.00; No. 2, 14.50; No. 5, 14.25 deld.

**Zirconium:** Reactor grade sponge, 100 lb or less, $7 per lb; 100-500 lb, $6.50 per lb; over 500 lb, $6 per lb.

(Note: Chromium, manganese, and silicon metals are listed in ferroalloy section.)

## SECONDARY METALS AND ALLOYS

**Aluminum Ingot:** Piston alloys, 24.875-26.25; No. 12 foundry alloy (No. 2 grade), 22.75-23.00; 5% silicon alloy, 0.60 Cu max., 24.75-25.00; 13 alloy, 0.60 Cu max., 24.75-25.00; 195 alloy, 26.25-27.00; 108 alloy, 23.25-23.50. Steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 23.75; grade 2, 22.50; grade 3, 21.25; grade 4, 20.75.

**Brass Ingot:** Red brass No. 115, 30.25; tin bronze, No. 225, 41.25; No. 245, 35.00; high-leaded tin bronze, No. 305, 34.50; No. 1 yellow, No. 405, 24.75; manganese bronze, No. 421, 27.75.

**Magnesium Alloy Ingot:** AZ63A, 37.50; AZ91B, 37.50; AZ91C, 41.25; AZ92A, 37.50.

## NONFERROUS PRODUCTS

### BERYLLIUM COPPER

(Base prices per lb, plus mill extras, 2000 to 5000 lb; nom. 1.9% Be alloy.) Strip, $1.91, f.o.b. Temple, Pa., or Reading, Pa.; rod, bar, wire, $1.89, f.o.b. Temple, Pa.

### COPPER WIRE

Bare, soft, f.o.b. eastern mills, 20,000-lb lots, 36.855; l.c.l., 37.48. Weatherproof, 20,000-lb lots, 37.42; l.c.l., 38.17.

### LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh.) Sheets, full rolls, 140 sq ft or more, $17.50 per cwt; pipe, full coils, $17.50 per cwt; traps and bends, list prices plus 30%.

### TITANIUM

(Prices per lb, 10,000 lb and over, f.o.b. mill.) Sheet and strip, $7.25-17.00; sheared mill plate, $5.25-10.00; wire, $5.75-10.00; forging billets, $3.55-5.75; hot-rolled and forged bars, $4.25-7.50.

(Prices per lb, c.l., f.o.b. mill.) Sheets, 26.00; ribbon zinc in coils, 21.50; plates, 20.00.

### ZIRCONIUM

Plate, $12.50-19.20; H.R. strip, $12.50-22.90; C.R. strip, $15.90-31.25; forged or H.R. bars, $11.00-17.40.

### NICKEL, MONEL, INCONEL

| | "A" Nickel | Monel | Inconel |
|---|---|---|---|
| Sheets, C.R. | 126 | 106 | 128 |
| Strip, C.R. | 124 | 108 | 138 |
| Plate, H.R. | 120 | 105 | 121 |
| Rod, Shapes, H.R. | 107 | 89 | 109 |
| Seamless Tubes | 157 | 129 | 200 |

### ALUMINUM

**Sheets:** 1100, 3003 and 5005 mill finish (30,000 lb base; freight allowed).

| Thickness Range Inches | Flat Sheet | Coiled Sheet |
|---|---|---|
| 0.250-0.136 | 42.80-47.30 | .... |
| 0.136-0.096 | 43.20-48.30 | .... |
| 0.126-0.103 | .... | 39.20-39.80 |
| 0.096-0.077 | 43.80-50.00 | 39.30-40.00 |
| 0.077-0.068 | 44.30-52.20 | .... |
| 0.077-0.061 | .... | 39.50-40.70 |
| 0.068-0.061 | 44.30-52.20 | .... |
| 0.061-0.048 | 44.90-54.40 | 40.10-41.80 |
| 0.048-0.038 | 45.40-57.10 | 40.60-43.20 |
| 0.038-0.030 | 45.70-62.00 | 41.00-45.70 |
| 0.030-0.024 | 46.20-53.70 | 41.30-45.70 |
| 0.024-0.019 | 46.90-56.80 | 42.40-44.10 |
| 0.019-0.017 | 47.70-54.10 | 43.00-44.70 |
| 0.017-0.015 | 48.60-55.00 | 43.80-45.50 |
| 0.015-0.014 | 49.60 | 44.80-46.50 |
| 0.014-0.012 | 50.80 | 45.50 |
| 0.012-0.011 | 51.00 | 46.70 |
| 0.011-0.0095 | 53.50 | 48.10 |
| 0.0095-0.0085 | 54.60 | 49.60 |
| 0.0085-0.0075 | 56.20 | 50.80 |
| 0.0075-0.007 | 57.70 | 52.30 |
| 0.007-0.006 | 59.30 | 53.70 |

### ALUMINUM (continued)

**Plates and Circles:** Thickness 0.250-3 in. 24-60 in. width or diam., 72-240 in. lengths.

| Alloy | Plate Base | Circle Base |
|---|---|---|
| 1100-F, 3003-F | 42.40 | 47.20 |
| 5050-F | 43.50 | 48.30 |
| 3004-F | 44.50 | 50.20 |
| 5052-F | 45.10 | 50.90 |
| 6061-T6 | 45.60 | 51.70 |
| 2024-T4 | 49.30 | 56.10 |
| 7075-T6* | 57.60 | 64.70 |

*24-48 in. width or diam., 72-180 in. lengths.

**Screw Machine Stock:** 30,000 lb base.

| Diam.(in.)or across flats* | Round 2011-T3 | Round 2017-T4 | Hexagonal 2011-T3 | Hexagonal 2017-T4 |
|---|---|---|---|---|
| 0.125 | 76.90 | 73.90 | .... | .... |
| 0.250 | 62.00 | 60.20 | 89.10 | 76.60 |
| 0.375 | 61.20 | 60.00 | 73.50 | 68.50 |
| 0.500 | 61.20 | 60.00 | 73.50 | 68.50 |
| 0.625 | 61.20 | 60.00 | 69.80 | 64.20 |
| 0.750 | 59.70 | 58.40 | 63.60 | 60.40 |
| 0.875 | 59.70 | 58.40 | 63.60 | 60.40 |
| 1.000 | 59.70 | 58.40 | 63.60 | 60.40 |
| 1.125 | 57.30 | 56.10 | 61.50 | 58.30 |
| 1.250 | 57.30 | 56.10 | 61.50 | 58.30 |
| 1.350 | 57.30 | 56.10 | 61.50 | 58.30 |
| 1.500 | 57.30 | 56.10 | 61.50 | 58.30 |
| 1.625 | 55.00 | 53.60 | .... | 56.20 |
| 1.750 | 55.00 | 53.60 | 60.30 | 56.20 |
| 1.875 | 55.00 | 53.60 | .... | 56.20 |
| 2.000 | 55.00 | 53.60 | 60.30 | 56.20 |
| 2.125 | 53.50 | 52.10 | .... | .... |
| 2.250 | 53.50 | 52.10 | .... | 56.20 |
| 2.375 | 53.50 | 52.10 | .... | .... |
| 2.500 | 53.50 | 52.10 | .... | 56.20 |
| 2.625 | .... | 50.40 | .... | .... |
| 2.750 | 51.90 | 50.40 | .... | 56.20 |
| 2.875 | .... | 50.40 | .... | .... |
| 3.000 | 51.90 | 50.40 | .... | 56.20 |
| 3.125 | .... | 50.40 | .... | .... |
| 3.250 | .... | 50.40 | .... | .... |
| 3.375 | .... | 50.40 | .... | .... |

*Selected sizes.

**Forging Stock:** Round, Class 1, random lengths, diam., 0.375-8 in., "F" temper; 2014, 42.20-55.00; 6061, 41.60-55.00; 7075, 61.60-75.00; 7070, 66.60-80.00.

**Pipe:** ASA schedule 40, alloy 6063-T6 standard length, plain ends, 90,000 lb base, dollars per 100 ft. Nominal pipe sizes: ⅜ in., 18.85; 1 in., 29.75; 1¼ in., 40.30; 1½ in., 48.15; 2 in., 58.30; 4 in., 160.20; 6 in., 287.55; 8 in., 432.70.

**Extruded Solid Shapes:**

| Factor | Alloy 6063-T5 | Alloy 6062-T6 |
|---|---|---|
| 9-11 | 42.70-44.20 | 51.30-55.50 |
| 12-14 | 42.70-44.20 | 52.00-56.50 |
| 15-17 | 42.70-44.20 | 53.20-58.20 |
| 18-20 | 43.20-44.70 | 55.20-60.80 |

### MAGNESIUM

**Sheet and Plate:** AZ31B standard grade, 0.32 in., 103.10; .081 in., 77.90; .125 in., 70.40; .188 in., 69.00; .250-2.0 in., 67.90. AZ31B spec. grades, .032 in., 171.30; .081 in., 108.80; .125 in., 98.10; .188 in., 95.70; .250-2.00 in., 93.30. Tread plate, 60-192 in. lengths, 24-72 in. widths; .125 in., 74.90; .188 in., 71.70-72.10; .25-.75 in., 70.60-71.60. Tooling plate, 0.25-3.0 in., 73.00.

**Extruded Solid Shapes:**

| Factor | Com. Grade (AZ31C) | Spec. Grade (AZ31B) |
|---|---|---|
| 6-8 | 65.30-67.60 | 84.60-87.40 |
| 12-14 | 65.30-67.60 | 85.70-88.00 |
| 24-26 | 66.10-75.30 | 90.60-91.30 |
| 36-38 | 66.10-75.30 | 104.20-105.30 |

## NONFERROUS SCRAP

### DEALERS' BUYING PRICES

**Copper and Brass:** No. 1 heavy copper and wire, 24.50-25.00; No. 2 heavy copper and wire, 22.50-23.00; light copper, 20.50-21.00; No. 1 composition red brass, 18.75-19.25; No. 1 com-

## BRASS MILL PRICES

MILL PRODUCTS a

| | Sheets, Strip, Plate | Rod | Wire | Seamless Tubes |
|---|---|---|---|---|
| Copper | 55.63b | 52.86c | .... | 55.82 |
| Yellow Brass | 48.24 | 32.73d | 48.78 | 51.65 |
| Low Brass, 80% | 51.23 | 51.17 | 51.77 | 54.54 |
| Red Brass, 85% | 52.29 | 52.23 | 52.83 | 55.60 |
| Com. Bronze, 90% | 53.90 | 53.84 | 54.44 | 56.96 |
| Manganese Bronze | 56.54 | 50.14 | 60.62 | .... |
| Muntz Metal | 50.85 | 46.16 | .... | .... |
| Naval Brass | 52.80 | 46.61 | 59.36 | 56.21 |
| Silicon Bronze | 60.67 | 59.86 | 60.21 | 78.35 |
| Nickel Silver, 10% | 63.82 | 66.15 | 66.15 | .... |
| Phos. Bronze | 75.34 | 75.84 | 77.02 | 28.625 |

SCRAP ALLOWANCES e (Based on copper at 31.50c)

| | Clean Heavy | Rod Ends | Clean Turnings |
|---|---|---|---|
| Copper | 27.500 | 27.500 | 26.750 |
| Yellow Brass | 20.625 | 19.750 | 18.750 |
| Low Brass, 80% | 23.250 | 23.000 | 22.500 |
| Red Brass, 85% | 24.250 | 24.000 | 23.500 |
| Com. Bronze, 90% | 25.125 | 24.875 | 24.375 |
| Manganese Bronze | 19.125 | 18.875 | 18.375 |
| Muntz Metal | 19.375 | 19.125 | 18.625 |
| Naval Brass | 19.125 | 18.875 | 18.375 |
| Silicon Bronze | 27.000 | 26.750 | 26.000 |
| Nickel Silver, 10% | 25.500 | 25.250 | 12.625 |
| Phos. Bronze | 28.625 | 28.375 | 25.750 |

a. Cents per lb, f.o.b. mill; freight allowed on 500 lb or more. b. Hot-rolled. c. Cold-drawn. d. Free cutting. e. Prices in cents per lb for less than 20,000 lb, f.o.b. shipping point. On lots over 20,000 lb at one time, of any or all kinds of scrap, add 1 cent per lb.

position turnings, 17.25-17.75; new brass clippings, 17.50-18.00; light brass, 12.75-13.25; heavy yellow brass, 13.25-13.75; new brass rod ends, 14.00-14.50; auto radiators, unsweated, 14.50-15.00; cocks and faucets, 14.75-15.25; brass pipe, 15.00-15.25.

**Lead:** Soft scrap lead, 7.75-8.25; battery plates, 2.25-2.50; linotype and stereotype, 9.25-9.75; electrotype, 7.75-8.25; mixed babbitt, 9.75-10.25.

**Monel:** Clippings, 30.00-32.00; old sheets, 26.00-28.00; turnings, 20.00-22.00; rods, 30.00-32.00.

**Nickel:** Sheets and clips, 52.00-54.00; rolled anodes, 52.00-54.00; turnings, 39.00-40.00; rod ends, 52.00-54.00.

**Zinc:** Old zinc, 3.25-3.50; new diecast scrap, 3.00-3.25; old diecast scrap, 1.75-2.00.

**Aluminum:** Old castings and sheets, 11.50-11.75; clean borings and turnings, 7.25-7.75; segregated low copper clips, 14.75-15.25; segregated high copper clips, 14.25-14.75; mixed low copper clips, 15.00-15.50; mixed high copper clips, 12.25-12.75.

(Cents per pound, Chicago)

**Aluminum:** Old castings and sheets, 12.25-12.75; clean borings and turnings, 10.00-10.50; segregated low copper clips, 17.25-17.75; segregated high copper clips, 16.25-16.75; mixed low copper clips, 16.50-17.00; mixed high copper clips, 15.75-16.25.

(Cents per pound, Cleveland)

**Aluminum:** Old castings and sheets, 11.50-11.75; clean borings and turnings, 10.75-11.25; segregated low copper clips, 15.75-16.25; segregated high copper clips, 14.75-15.75; mixed low copper clips, 15.25-15.75; mixed high copper clips, 14.25-14.75.

### REFINERS' BUYING PRICES

(Cents per pound, carlots, delivered refinery)
**Beryllium Copper:** Heavy scrap, 0.020-in. and heavier, not less than 1.5% Be, 57.50; light scrap, 52.50; turnings and borings, 37.50.

**Copper and Brass:** No. 1 heavy copper and wire, 27.00; No. 2 heavy copper and wire, 25.75; light copper, 23.50; refinery brass (60% copper) per dry copper content, 25.25.

### INGOTMAKERS' BUYING PRICES

**Copper and Brass:** No. 1 heavy copper and wire, 27.00; No. 2 heavy copper and wire, 25.75; light copper, 23.50; No. 1 composition borings, 21.50; No. 1 composition solids, 22.00; heavy yellow brass solids, 16.00; yellow brass turnings, 15.00; radiators, 17.50.

## PLATING MATERIAL

(F.o.b. shipping point, freight allowed on quantities)

### ANODES

**Cadmium:** Special or patented shapes, $1.30.

**Copper:** Flat-rolled, 47.79; oval, 46.00, 5000-10,000 lb; electrodeposited, 40.50, 2000-5000 lb lots; cast, 43.00, 5000-10,000 lb quantities.

**Nickel:** Depolarized, less than 100 lb, 114.25; wire, 27.00; No. 2 heavy copper and wire, 26.00; light copper, 23.75; refinery brass deduct 3 cents a lb.

**Tin:** Bar or slab, less than 200 lb, 123.50; 200-499 lb, 122.00; 500-999 lb, 121.50; 1000 lb or more, 121.00.

**Zinc:** Balls, 18.00; flat tops, 18.00; flats, 20.75; ovals, 20.00, ton lots.

### CHEMICALS

**Cadmium Oxide:** $1.30 per lb in 100-lb drums.
**Chromic Acid (flake):** 100-2000 lb, 31.00; 2000-10,000 lb, 30.50; 10,000-20,000 lb, 30.00; 20,000 lb or more, 29.50.

**Copper Cyanide:** 100-200 lb, 65.90; 300-900 lb, 63.00; 1000-19,900 lb, 61.90.

**Copper Sulphate:** 100-1900 lb, 15.30; 2000-5900 lb, 13.30; 6000-11,900 lb, 13.05; 12,000-22,900 lb, 12.80; 23,000 lb or more, 12.30.

**Nickel Chloride:** 100 lb, 45.00; 200 lb, 43.00; 300 lb, 42.00; 400-4900 lb, 40.00; 5000-9900 lb, 38.00; 10,000 lb or more, 37.00.

**Nickel Sulphate:** 5000-22,999 lb, 29.00; 23,000-39,990 lb, 28.50; 40,000 lb or more, 28.00.
**Sodium Cyanide (Cyanobrik):** 200 lb, 20.80; 400-800 lb, 19.80; 1000-19,800 lb, 18.80; 20,000 lb or more, 17.80.

**Sodium Stannate:** Less than 100 lb, 81.20; 100-600 lb, 71.70; 700-1900 lb, 69.00; 2000-9900 lb, 67.10; 10,000 lb or more, 65.80.

**Stannous Chloride (Anhydrous):** 25 lb, 156.80; 100 lb, 152.00; 400 lb, 149.50; 800-19,900 lb, 108.70; 20,000 lb or more, 102.60.

**Stannous Sulphate:** Less than 50 lb, 141.90; 50 lb, 111.90; 100-1900 lb, 109.90; 2000 lb or more, 107.90.

**Zinc Cyanide:** 100-200 lb, 59.00; 300-900 lb, 57.00.

(Concluded from Page 203)

hem Steel Co., Bethlehem, Pa., and $2,265,262 by American Bridge Div., U. S. Steel Corp., Pittsburgh.

2000 tons, Bomarc launcher projects, Washington and Oregon; bids to U. S. Engineer, Seattle, July 7 and July 9.

1400 tons, Hamilton Ave., municipal incinerator, Brooklyn, N. Y., Sovereign Construction Co., Ft. Lee, New Jersey, low on the general contract.

1124 tons, state bridgework, Mercer County, New Jersey, bids July 1; 565 tons of reinforcing steel also required.

1050 tons, state bridgework, Henrico and Hanover Counties, route 54, Virginia.

940 tons, state bridgework, Lebanon, Bosrah, and Norwich, Conn., bids closed June 8.

910 tons, mostly angles, General Stores Supply Office, Navy, Philadelphia; bids June 15.

860 tons, Cougar Dam, Oregon; bids in to U. S. Engineer, Portland, Oreg.

629 tons, Grace Institute, Lexington Ave. and E. 75th St., New York, project withdrawn.

476 tons, bridge and approach work, Central Railroad of New Jersey, Woodbridge, N. J., bids June 19.

390 tons, gymnasium, Riverdale School, Bronx, New York, bids closed.

360 tons, Idaho state highway span, Pocatello; general contract to LaGrande-Johnson Co., Salt Lake City, Utah.

335 tons, state bridgework, Hudson County, New Jersey, bids June 25; 112 tons of reinforcing steel also required.

## REINFORCING BARS . . .

### REINFORCING BARS PLACED

270 tons, high school, Wayland, Mass., to Joseph T. Ryerson & Son Inc., Boston; N.D.C. Construction Co., Boston, general contractor.

120 tons, Mountlake, Wash., high school, to Bethlehem Pacific Coast Steel Corp., Seattle; Brazier Construction Co., Seattle, general contractor.

100 tons or more, two elementary schools, Lawrence, Mass., to Barker Steel Co., Boston (reinforcing), Manuel Greenberg Co., Lawrence (structurals); Vara Construction Co., Boston, general contractor.

### REINFORCING BARS PENDING

1225 tons, Cougar Dam, McKenzie River, Oregon; Merritt-Chapman & Scott, New York, low at $23,985,564 to U. S. Engineer, Portland, Oreg.

835 tons, General Stores Supply Office, Navy, Philadelphia; bids June 15.

656 tons, state bridgework, Mercer County, New Jersey, bids July 1; 1124 tons of structural steel also required.

380 tons, high school, La Salle College, Montgomery County, Pa.; bids asked; 320 tons of structurals also required.

218 tons, also lump sum for unstated structurals, Montana state highway overpass; bids to Helena, Mont., June 17.

215 tons, I-beam bridge, Waterville, Maine; bids June 17, Augusta, Maine.

125 tons, two girder bridges, Douglas County, Oreg.; bids to Bureau of Public Roads, Portland, Oreg., June 18.

112 tons, state bridgework, Hudson County, New Jersey; bids June 25; also 335 tons of structural steel required.

## PLATES . . .

### PLATES PENDING

560 tons, steel sheet piling, also 24,400 ft of 16 in. steel pipe piling, and 36,600 ft of 20 in. prestressed concrete piling; bids to Commission of Public Works and Docks, Portland, Oreg., July 2.

100 tons or more, water tank for Kennewick, Wash.; American Pipe & Construction Co., Portland, Oreg., low bidder at $28,900; alternatives also bid.

100 tons or more, 500,000 gal water tank, Corvallis, Oreg.; American Pipe & Construction Co., Portland, Oreg., low bidder at $21,850.

## RAILS, CARS . . .

### RAILROAD CARS PLACED

Pennsylvania Railroad, 600 piggyback cars, 300 to Pullman-Standard Car Mfg. Co., Chicago, and 300 to ACF Industries, New York.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**TO FIND THE MAN YOU NEED . . .**

Place an advertisement in the "Help Wanted" columns of STEEL's classified pages. Your advertisement will reach the qualified men you need, because STEEL is addressed to highly-trained men in all phases of metalworking

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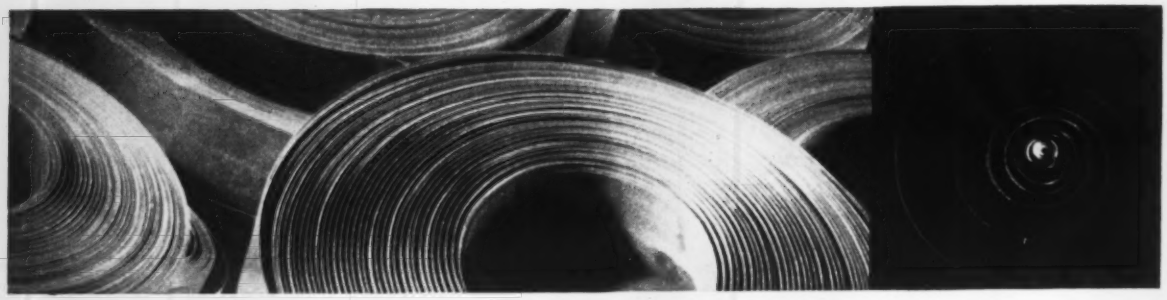

# How they're using

# Wallace Barnes Cold-rolled Specialty Steels

1. *In Three Drawing Stations*

The part shown in illustration one was made from .59 – .74% carbon steel in three drawing stations. From .70 – .80% carbon, this piece should have four or five drawing stations. The piece could be made from .90 – 1.05% carbon, but would require seven drawing stations with fully annealed steel.

2. *Blanked on 45° Angle*

The stamping shown in the second illustration was made from .70 – .80% carbon spring steel. It was blanked and pierced on a 45° angle, with small holes pierced to prevent fracture in later forming and bending. It was then given severe secondary forming. The small tab shows "orange peel" and probable fracture would occur if the part were formed from .90 – 1.05% carbon.

3. *All Flanging One Operation*

Our third part is a gun stamping made from .70 – .80% carbon with a sharp bend with the grain in one stroke of the press. Higher carbon will fracture due to its less ductile qualities.

4. *Thirteen Steps Progressive*

The fastener shown in the fourth illustration was made from the .59 – .74% carbon steel, the only spring steel which would take the bends and draws to which it is subjected here. All the higher carbon steels were rejected because they failed under the cold-work necessary to produce the two small extrusions. It took seven reductions to bring these extrusions within tolerance. There were thirteen steps total in the progressive die.

These examples show how proper steel selection may save operations and insure satisfactory performance. Among the many sizes and types of Wallace Barnes cold-rolled specialty steels is the right one for your application. Send for "Physical Property Charts" giving tensile strength and forming properties of Wallace Barnes tempered steels.

**Wallace Barnes Steel Division**

**Bristol, Connecticut**

**Associated Spring Corporation**

5809

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For complete details contact your local Reliance Representative or write for Bulletin D-2507.

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MASTER R REEVES

# 3 new applications get longer life and minimum maintenance using Dodge pillow blocks with Timken® bearings

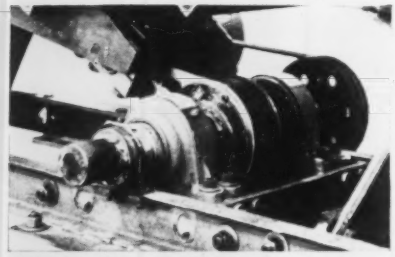
PICTURED below are three applications where Timken bearing equipped Dodge pillow blocks stay on the job with little attention under tough conditions. Their tapered design lets Timken® bearings take *both* radial and thrust loads in any combination. And full-line contact between rollers and races provides extra load-carrying capacity. Wear is reduced, maintenance is cut to the minimum.

Cutaway view shows the Dodge All-Steel pillow block with Timken bearing mounting. Of special design, the bearing has a tapered bore with self-aligning spherical outer surface —never needs adjustment.

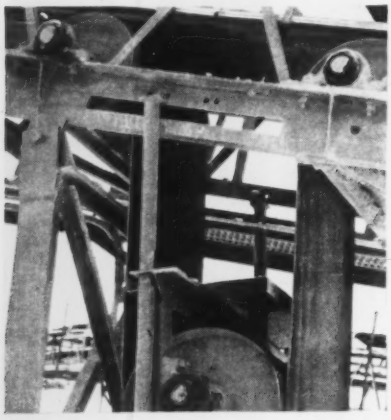
Besides the All-Steel pillow block, other versatile Dodge pillow blocks with Timken tapered roller bearings are: Type "E", Double-Interlock, Type "C" and Special Duty. All are compact in design. Special thrust devices that take up extra space are not needed.

Timken bearings bring Betterness to any machines because Betterness rolls on Timken *tapered* roller bearings. So specify bearings trademarked "TIMKEN" for the machines you buy or build. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

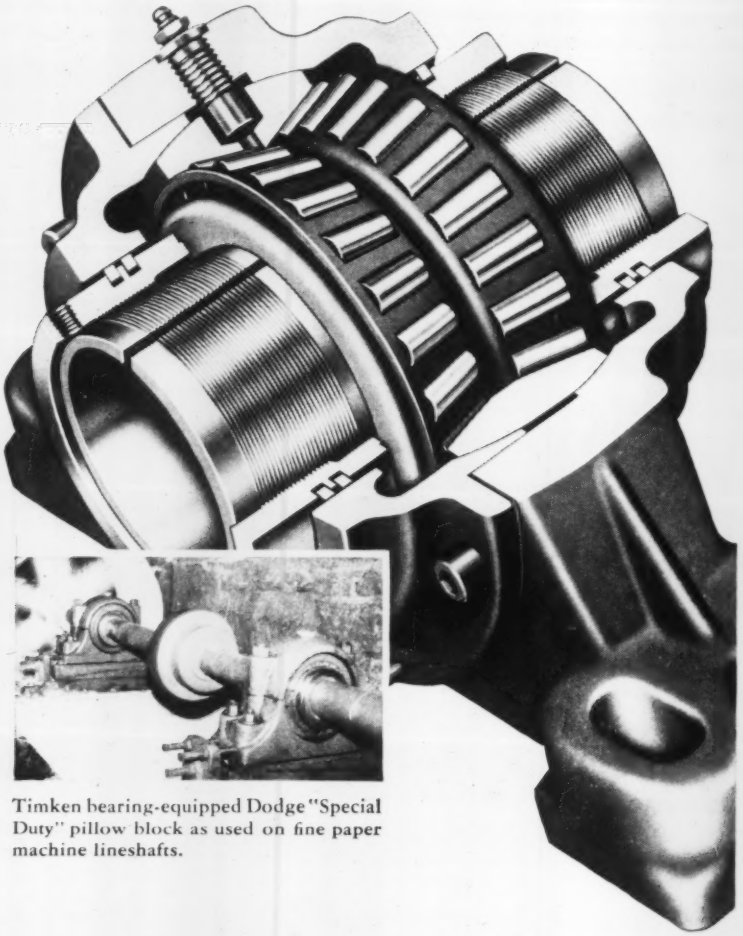
*This symbol on a product means its bearings are the best.*



Timken bearing-equipped Dodge All-Steel pillow block used in a vibrating conveyor.



Timken bearing-equipped Dodge Type "E" pillow block used in sand and gravel plant.



Timken bearing-equipped Dodge "Special Duty" pillow block as used on fine paper machine lineshafts.

**TIMKEN**

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